

# SHASTA REGIONAL CLIMATE ACTION PLAN



November 2012



SHASTA REGIONAL  
CLIMATE  
ACTION  
PLAN

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November 2012



**AECOM**

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# Chapter 1 - Introduction

In 2010, the Shasta County Air Quality Management District (District) initiated the regional climate action planning (RCAP) process. The primary objectives of the RCAP process are to contribute to the State's climate protection efforts and to provide California Environmental Quality Act (CEQA) review streamlining benefits for development projects within the region's four jurisdictions: the City of Anderson, the City of Redding, the City of Shasta Lake, and the unincorporated areas of Shasta County. To facilitate these objectives, the District worked with the four jurisdictions to prepare community-specific, independent climate action plans that contain greenhouse gas (GHG) emission inventories and forecasts, emission reduction measures, and implementation and monitoring programs. The climate action plans, located within chapters 2, 3, 4, and 5 of this document, provide a summary of jurisdictional Greenhouse Gas inventories and describe how each jurisdiction will achieve GHG reductions through local actions that contribute to the statewide GHG emissions reduction target defined in Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, CEQA guidelines, and other State guidance. The RCAP document serves as a collection of the individual climate action plans and demonstrates the region's commitment to the State's GHG reduction efforts.

## CALIFORNIA CLIMATE PROTECTION LEADERSHIP

California has adopted a variety of legislation aimed at reducing the state's GHG emissions. This section describes: a) legislation pertaining to California's emissions reduction targets, b) statewide actions that will help reduce emissions in the Shasta region, and c) the State's guidance to local jurisdictions related to GHG emissions.

### STATE LEGISLATION PERTAINING TO CALIFORNIA'S GREENHOUSE GAS EMISSIONS REDUCTION TARGETS

Executive Order S-3-05 (EO-S-3-05) and AB 32 are the primary legislation that defines the State's GHG emission reduction targets. These policies identify both near-term and long-term reduction goals and have directed subsequent implementation legislation as described within the Climate Change Scoping Plan.

**Executive Order S-3-05**

EO-S-3-05 recognizes California’s vulnerability to reduced snowpack in the Sierra Nevada Mountains, exacerbation of air quality problems, and potential sea level rise due to a changing climate. To address these concerns, the executive order established targets to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

**Assembly Bill 32 (2006)**

AB 32 requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directs the California Air Resources Board (ARB) to develop and implement regulations that reduce statewide GHG emissions. AB 32 also requires ARB to adopt a quantified cap on GHG emissions that represents 1990 emissions levels, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement tools to assist the State to achieve the required GHG emission reductions.

**Climate Change Scoping Plan**

The Climate Change Scoping Plan was approved by ARB in December 2008 and outlines the State’s plan to achieve the GHG reductions required in AB 32. The Scoping Plan contains the primary strategies California will implement to achieve a reduction of 169 million metric tons (MMT) of carbon dioxide equivalent (CO<sub>2</sub>e), or approximately 28% from the state’s projected 2020 emission level.

## **STATEWIDE ACTIONS WITH CONSIDERABLE EMISSIONS REDUCTION POTENTIAL IN SHASTA COUNTY**

The State of California has initiated a wide variety of regulations and programs to reduce statewide GHG emissions. These include regulations and programs addressing emissions from passenger cars and trucks, regulations requiring increased amounts of electricity generated from renewable sources, and regulations requiring increased building energy efficiency. These actions will effectively reduce emissions within the Shasta region and assist the jurisdictions in achieving their reduction targets. Statewide actions relied upon in the jurisdictions’ CAPs are described below:

**Assembly Bill 1493 (2002) – California Clean Car Standards**

AB 1493, California Clean Car Standards, requires ARB to develop and adopt regulations to reduce GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation. In 2004, ARB approved amendments to the California Code of Regulations adding GHG emissions standards to California’s existing standards for motor vehicle emissions.

**Executive Order S-1-07 (2007) – Low Carbon Fuel Standard**

EO-S-1-07 established a Low-Carbon Fuel Standard to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10% by 2020.

**Senate Bill 375 (2008) – Sustainable Communities and Climate Protection Act**

Senate Bill (SB) 375, the Sustainable Communities and Climate Protection Act, aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO’s Regional Transportation Plan. Qualified projects consistent with an approved SCS or Alternative Planning Strategy and categorized as “transit priority projects” receive incentives under new provisions of the California Environmental Quality Act (CEQA).



### **Medium/Heavy Duty Vehicle Efficiency Program**

Medium- and heavy-duty vehicle efficiency reductions in the RCAP were calculated based on the Heavy-Duty Vehicle GHG Emission Reduction (aerodynamic efficiency) and the Medium- and Heavy-Duty Vehicle Hybridization regulations. The Heavy-Duty Vehicle GHG Emission Reduction regulations require existing trucks/trailers to be retrofitted with technologies that reduce GHG emissions and improve the fuel efficiency of trucks through reductions in aerodynamic drag and rolling resistance. The Medium- and Heavy-Duty Vehicle Hybridization regulations address the application of hybrid electric technology to reduce GHG emissions and fuel consumption related to stop-and-go driving, idling, and power take-off operations in their duty cycle.

### **Renewable Portfolio Standard**

SB 1078, SB 107, EO-S-14-08, and SB X1-2 have established increasingly stringent Renewable Portfolio Standard (RPS) requirements for California utilities. RPS-eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro.

- SB 1078 required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020.
- SB 107 accelerated the SB 1078 timeframe to take effect in 2010.
- EO-S-14-08 increased the RPS further to 33% by 2020.
- SB X1-2 codified the 33% RPS by 2020 requirement established by EO-S-14-08 and extended the scope of requirement to include both investor-owned and municipally-owned utilities.

## **STATE GUIDANCE TO LOCAL JURISDICTIONS RELATED TO GREENHOUSE GAS EMISSIONS**

The State has provided direct guidance regarding how local jurisdictions are to address locally-generated GHG emissions. This guidance makes it clear that local governments are considered “essential partners” in achieving the State’s GHG reduction goals and have a responsibility to reduce emissions within existing and planned development within their communities. Key guidance is described below.

### **Climate Change Scoping Plan**

EO-S-13-08 directs the Governor’s Office of Planning and Research (OPR), in cooperation with the California Resources Agency (CRA), to provide land use planning guidance related to sea level rise and other climate change effects.

### **Senate Bill 97 (2007)**

SB 97 acknowledges that climate change is a prominent environmental issue that requires analysis under the California Environmental Quality Act (CEQA). Pursuant to SB 97, the State CEQA Guidelines were updated in 2010 to include provisions for mitigating GHG emissions and/or the effects of GHG emissions. The amended CEQA Guidelines (Section 15183.5) allow jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impacts analysis. If a plan is to be used for tiering or incorporation by reference purposes, it should contain enforceable reduction measures and demonstrate that it can reliably reduce the community’s GHG emissions to a degree that contributes its fair share to State emissions reduction efforts (see Attorney General’s guidance below).

### **Executive Order S-13-08 (2008)**

EO-S-13-08 directs OPR, in cooperation with CRA, to provide land use planning guidance related to sea level rise and other climate change effects. The order also directed CRA to develop a State Climate Adaptation Strategy by June 30, 2009 and to convene an independent panel to complete the first California Sea Level Rise Assessment Report.

### **Attorney General's Guidance**

The Office of the Attorney General, under Jerry Brown and Kamala Harris, has issued comment letters to local jurisdictions preparing GHG reduction strategies or related projects. These comment letters identify the State's *expectations* of local government's with regard to climate protection efforts, though there are not yet any definitive legal requirements that would give the Attorney General's guidance the force of law.

In March 2009, the State Attorney General's Office emphasized that communitywide targets should align with an emissions trajectory that reflects California's near-term (1990 levels by 2020) and long-term (80 percent below 1990 levels by 2050) GHG emissions limits set forth in AB 32 and Executive Order S-3-05. The Attorney General's August 2009 comment letter states that GHG projections associated with a General Plan update should estimate the emission levels through the full planning horizon not just in 2020. Though the letter only explicitly calls for planning horizon projections, it is assumed that an interim year emission reduction target is also recommended. An August, 2009 comment letter states that GHG reduction plans and related documents need to identify GHG reduction estimates for measures and provide the underlying and substantiated assumptions. A further May 2010 letter states that proposed measures relating to GHG reductions need to be specific and enforceable.

### **CEQA Guidelines (Section 15183.5)**

In 2010, the State revised its CEQA Guidelines to incorporate updated guidance related to GHGs. Section 15183.5 allows a qualified GHG reduction strategy to provide streamlining benefits for a local jurisdiction given it meets certain requirements. The jurisdiction must prepare a comprehensive GHG emissions inventory and anticipated emissions projections over a specified time period based on current and planned project activity within the jurisdiction. An emissions reduction target must also be established, below which contributions to GHG emissions from activities covered by the plan would not be considered cumulatively significant. The jurisdiction must develop measures and performance standards that, when implemented as specific project requirements, collectively achieve the reduction target. The plan must also contain a monitoring mechanism to track implementation progress and require amendments if the plan is not achieving specified reduction levels. The Plan also must be adopted in a public process following environmental review (e.g., certification of an Environmental Impact Report or adoption of a negative declaration, mitigated negative declaration, or other environmental document).

### **California Climate Change Adaptation Policy Guide**

In 2012, the California Emergency Management Agency and the California Natural Resources Agency released the *Draft California Climate Change Adaptation Policy Guide* (Guide) to assist local and regional governments in their preparations for climate change. The Guide is organized into 11 climate impact regions based on environmental and socioeconomic settings. Impacts are organized into seven climate impact sectors: equity, health, and socio-economics; ocean and coastal resources; water management – surface water; forestry and rangeland; biodiversity and habitat; agriculture; and infrastructure. Potential adaptation strategies and policies are also provided. The Guide identifies GHG reductions as a goal to be pursued in tandem with adaptation planning, and identifies the need to ensure that CAP measures do not conflict with adaptation planning efforts.

## THE SHASTA APPROACH

The Shasta Regional CAP was prepared to achieve various local objectives and reflect the region's unique opportunities and challenges. As previously stated, there is no adopted legislation requiring local jurisdictions to establish emissions reduction targets. However, the jurisdictions preparing the RCAP are seeking CEQA project streamlining and have prepared this plan to comply with the CEQA guidelines (as described above).

This plan reflects the reality of Shasta County today. While the jurisdictions are serious about supporting statewide emissions reduction targets, local efforts need to be compatible with supporting a strong local economy and protecting the personal freedom of Shasta County residents and businesses. The plan's measures were also written to reflect the character of development in the county. Traditional climate action planning measures that have been developed for urban communities do not make sense in these jurisdictions, nor would ambitious programs that require expensive local funding commitments. The RCAP measures were written to rely heavily on voluntary, market-based programs that can be implemented economically and on existing utility- and jurisdictionally-sponsored programs.

The individual CAPs included in this plan provide guidance to achieve a 2020 emissions reduction target. The jurisdictions will update their plans as they see fit to include more robust reduction measures that contribute to the 2035 and 2050 reduction targets, but will again rely heavily upon statewide programs and activities to generate the majority of the required reductions.

## RCAP PROCESS

Development of the RCAP parallels climate change planning processes followed by other California jurisdictions. This process includes:

- Completion of a baseline GHG emissions inventory and forecasting future emissions;
- Identification of a communitywide GHG reduction target;
- Identification and development of GHG reduction measures and actions to meet the reduction target and evaluation of their environmental impacts consistent with the California Environmental Quality Act; and
- Monitoring the effectiveness of reduction measures and adapting the plan to changing conditions.

## BASELINE EMISSIONS INVENTORY AND FORECASTS

The purpose of a GHG emissions inventory is to gather information about sources of emissions in order to assist policy makers in effectively implementing cost-effective GHG reduction policies, actions, and control measures in policy areas over which they have operational and discretionary control. An accurate inventory is necessary to understand which sectors comprise the largest portion of the GHG inventory, have the most reduction potential, and can be effectively influenced by policies and actions implemented by the jurisdictions. The jurisdictions prepared baseline GHG emissions inventories for 2008 using data from a variety of information sources.

The baseline inventories are organized by emission sectors. A “sector” is a distinct subset of a market, society, industry, or economy, whose components share similar characteristics. An emission sector may also contain subsectors that provide more specificity about the source of emissions (e.g., natural gas or electricity can be a subsector of energy consumption). The total number of sectors included in each jurisdiction's inventory varies depending on local factors. However, each inventory developed for the RCAP contains basic emissions sectors, including energy, transportation, solid waste, water, and off-road

vehicles. Some inventories include additional applicable sectors, such as stationary sources, agriculture, and forestry.

The baseline inventories were used to forecast GHG emissions for three horizon years (i.e., 2020, 2035, and 2050) under a business-as-usual scenario. The business-as-usual scenario assumes that historical and current GHG-generating practices and trends for each sector will continue to each horizon year. The business-as-usual forecasts do not include GHG reductions associated with statewide GHG reduction programs or RCAP measures. The GHG reduction measures developed for the RCAP are applied to the 2020 emissions levels to determine if the jurisdictions will achieve their GHG reduction targets.

## EMISSIONS REDUCTION TARGETS

The unincorporated portion of Shasta County, the City of Anderson, and the City of Shasta Lake have set three emissions reduction targets for years that align with State climate legislation and local planning efforts (i.e., 2020, 2035, and 2050). The City of Redding chose to focus on 2020 emissions reduction targets. The reduction targets were purposefully set at levels that are likely to provide CEQA streamlining benefits to new development projects in the community. Each jurisdiction calculated a target that would equate to emissions 15% below 2008 levels by 2020. Additionally the jurisdictions, with the exception of Redding, calculated targets that would equate to emissions 49% below 2008 levels by 2035; and 83% below 2008 levels by 2050.

## REDUCTION MEASURE DEVELOPMENT

A combination of statewide actions and local emissions reduction efforts contribute to target achievement. As previously described, statewide emissions reduction programs have been developed to implement AB 32. These statewide actions provide the majority of reductions in each jurisdiction. Local reduction measures and actions are included to address the remaining gap between the reduction targets and statewide actions. These local actions are organized into reduction categories according to the source of emissions that they address. Reduction categories vary among the jurisdictions based on local opportunities and constraints, and include energy, solid waste, transportation, water, and carbon sequestration. The recommended local actions affect issues within the jurisdictions' direct influence.

Measures and actions are recommended that translate the vision of the CAP into on-the-ground action. Measures define the direction that the City and County will take to accomplish GHG reduction goals. Actions define the specific steps that the City and County will take over time. Measures were developed by (a) evaluating existing community conditions, (b) identifying emission reduction opportunities within the jurisdictions, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating State and regional laws, guidelines, and recommendations. After considering a wide range of potential options, measures and actions were recommended based on the following criteria:

- Is it technically feasible to implement the measure?
- Does the measure create additional community benefits (e.g., lower utility bills, public health)?
- Would the community support the measure?

## REDUCTION MEASURE IMPLEMENTATION

Ensuring that the measures translate from policy language into on-the-ground results is critical to the success of the CAP. To facilitate this, each measure contains a table that identifies the specific actions the jurisdictions will carry out and identifies the responsible departments.

The second section of each table provides progress indicators that enable local government staff and the public to track measure implementation and monitor the overall CAP progress. The tables provide

both interim and final progress indicators where possible. Interim progress indicators are especially important, as they provide mid-course checks to evaluate if a measure is on the right path to achieving its GHG reductions.

Upon adoption of the CAP, the identified departments and/or organizations will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee action implementation. In order to assess the status of local action efforts, CAP implementation meetings will occur on a regular basis. Some actions will require inter-departmental or inter-agency cooperation and appropriate partnerships will need to be established accordingly.

## RCAP ORGANIZATION

The RCAP is organized into five chapters and supporting appendices. Chapter 1 provides an overarching introduction to the RCAP, describing its purpose, State leadership and regulations related to climate change, and how the plan acknowledges the unique context of Shasta County.

Chapters 2-5 contain CAPs for each participating jurisdiction. Each of these chapters was prepared to function as a stand-alone CAP that could be adopted by the individual jurisdictions. The chapters begin with a description of the purpose for preparing the CAP, and then present the GHG emissions inventory and forecasts; local GHG emissions reduction targets; GHG emissions reduction measures specific to that community; and an implementation and monitoring program for the CAP.

The three supporting appendices provide detailed information on the methodologies used to calculate the emissions inventories and forecasts, quantify the reduction measures, and establish the reduction targets. The following appendices are included at the end of this plan:

- Appendix A – GHG Emissions Inventory and Forecasts Methodology
- Appendix B – GHG Reductions Quantification Methodology
- Appendix C – Target Setting Methodology
- Appendix D – Economic Analysis

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# Chapter 2 – Unincorporated Shasta County

## PURPOSE

This chapter serves as the Climate Action Plan (CAP) for unincorporated Shasta County. The County has developed this plan in order to contribute to the State’s climate protection efforts and to provide California Environmental Quality Act (CEQA) streamlining benefits for new residential and commercial development projects within the community. As stated in State CEQA Guidelines Section 15183.5, for a qualified greenhouse gas (GHG) reduction strategy to provide streamlining benefits for a local jurisdiction, it needs to include the following elements:

- GHG emissions for the jurisdiction need to be quantified through a comprehensive and complete inventory effort. This means identifying and analyzing GHG emissions from specific actions or categories of actions;
- GHG emissions need to be quantified for both existing and anticipated emissions over a specified time period, that result from current and planned activities within the defined jurisdiction area;
- Establish a reduction target for the jurisdiction, below which the contribution to GHG emissions from activities covered by the plan would not be considered cumulatively significant. All assumptions and calculations in making this determination should be transparent. A margin of safety should be built into the plan as well;
- Specify policies, measures, or programs, including performance standards that would collectively achieve the specified emissions reduction level if implemented as a specific project requirement or across a community as an incentive program. An overall reduction plan needs to address existing as well as new development reduction strategies, and should rely primarily on mandatory measures;
- A clearly defined mechanism to monitor the plan’s implementation progress toward achieving reduction levels, and to require amendment if the plan is not achieving specified levels.



The content of this chapter is structured to demonstrate compliance with these required elements and to provide the unincorporated County and community with a useful resource to implement these important actions.

## GREENHOUSE GAS EMISSION INVENTORY AND FORECASTS

The following section provides a summary of unincorporated Shasta County's communitywide 2008 baseline GHG emissions inventory, the business-as-usual emissions forecasts, and the adjusted business-as-usual (ABAU) forecasts. Detailed information regarding the calculation and assumptions used in preparing the GHG emissions inventory and forecasts is provided in Appendix A.

### GREENHOUSE GAS EMISSIONS INVENTORY

The 2008 GHG emissions inventory serves as the foundation of the unincorporated County's CAP. Using data collected from County departments, utilities, and other relevant agencies and locally-specific emissions factors, the inventory provides an accurate assessment of the sources of GHG emissions generated within the County or as a direct result of County operations (even if outside unincorporated county areas) in the baseline year. This data allows the County to establish a baseline inventory and identify appropriate GHG reduction targets and strategies.

To ensure a comprehensive and complete GHG inventory, the County developed a *Total Inventory* that contains emissions from all sectors including building energy (electricity and natural gas), transportation, waste, water, off-road vehicles/recreation, stationary sources (industrial), agriculture, and forestry. Due to a lack of jurisdictional control over the GHG emissions produced by agriculture, forestry, and stationary sources, these sectors are excluded from the *Jurisdictional Inventory*. Examples of permitted stationary sources that are not under the control of the County include cement plants, biomass facilities, and other industrial processes at manufacturing facilities. These facilities and equipment are permitted by the Shasta County Air Quality Management District, and their GHG emissions would be controlled under the jurisdiction of the Air Resources Board pursuant to AB 32. The Jurisdictional Inventory is used within this CAP for the purposes of developing reduction targets and strategies.

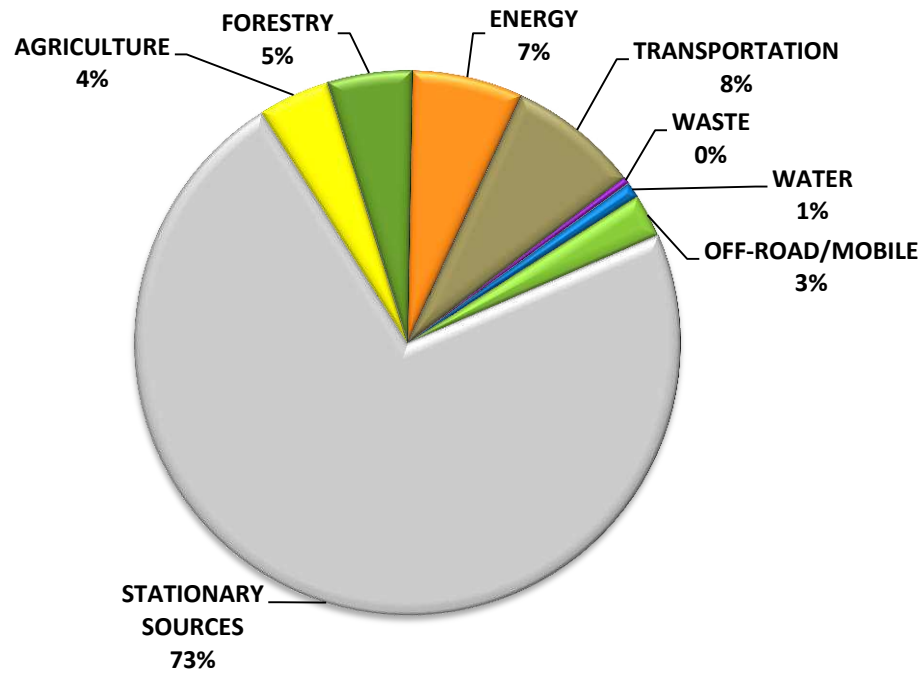
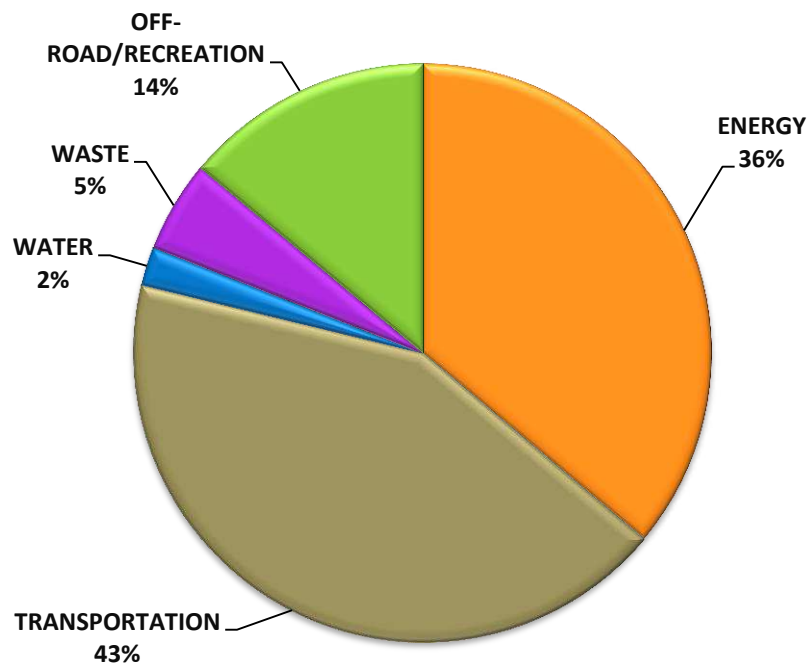
#### Total Inventory

In 2008, the community's total baseline emissions included 3,131,054 metric tons of carbon dioxide equivalent emissions (MT CO<sub>2</sub>e). As shown in Figure 2.1 and Table 2.1, stationary sources generated the largest portion of emissions at approximately 2,271,000 MT CO<sub>2</sub>e (73% of the total emissions). The transportation sector generated the second highest amount of emissions in the unincorporated County at approximately 243,700 MT CO<sub>2</sub>e (8% of the total emissions), followed by energy consumption emissions at approximately 206,300 MT CO<sub>2</sub>e (7% of the total emissions). The forestry sector contributed approximately 156,500 MT CO<sub>2</sub>e (5% of total emissions), and the agriculture sector generated approximately 132,200 MT CO<sub>2</sub>e (4% of total emissions). The off-road vehicle/recreation, solid waste, and water (including water and wastewater) sectors comprise the remaining 4% of the emissions inventory.

#### Jurisdictional Inventory

With the removal of the agriculture, forestry, and stationary source sector emissions, the community's baseline jurisdictional inventory lowers to 571,255 MT CO<sub>2</sub>e in 2008. As shown in Figure 2.2, transportation generated 43% of total emissions, and energy production and consumption generated 36% of total emissions. The off-road vehicles/recreation sector contributed approximately 14%, and the waste sector contributed approximately 5% of total emissions. The water sector comprised the remaining 2% of total emissions.



**Figure 2.1 – 2008 Total Greenhouse Gas Emissions Inventory by Sector****Figure 2.2 – 2008 Jurisdictional Greenhouse Gas Emissions Inventory by Sector**

**Table 2.1 – Greenhouse Gas Emissions Inventory and Business-as-Usual Forecasts: 2008, 2020, 2035, and 2050**

| Sector  | 2008<br>(MT CO <sub>2</sub> e/yr) | 2020<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 | 2035<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 | 2050<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 |
|---|-----------------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|
| Energy  | 206,309                           | 226,132                           | 10%                         | 268,384                           | 30%                         | 317,117                           | 54%                         |
| Transportation                                    | 243,668                           | 275,326                           | 13%                         | 335,539                           | 38%                         | 397,095                           | 63%                         |
| Solid Waste                                       | 29,233                            | 31,498                            | 8%                          | 36,221                            | 24%                         | 40,627                            | 39%                         |
| Water   | 12,342                            | 13,298                            | 8%                          | 15,292                            | 24%                         | 17,152                            | 39%                         |
| Off-Road and<br>Recreation                        | 79,703                            | 85,878                            | 8%                          | 98,754                            | 24%                         | 110,767                           | 39%                         |
| Stationary<br>Sources<br>(Non-<br>Jurisdictional) | 2,271,027                         | 2,271,027                         | 0%                          | 2,271,027                         | 0%                          | 2,271,027                         | 0%                          |
| Agriculture<br>(Non-<br>Jurisdictional)           | 132,234                           | 132,234                           | 0%                          | 132,234                           | 0%                          | 132,234                           | 0%                          |
| Forestry<br>(Non-<br>Jurisdictional)              | 156,538                           | 156,538                           | 0%                          | 156,538                           | 0%                          | 156,538                           | 0%                          |
| <b>TOTAL<br/>INVENTORY</b>                        | <b>3,131,054</b>                  | <b>3,191,931</b>                  | <b>2%</b>                   | <b>3,313,989</b>                  | <b>6%</b>                   | <b>3,442,556</b>                  | <b>10%</b>                  |
| <b>JURISDICTIONAL<br/>INVENTORY</b>               | <b>571,255</b>                    | <b>632,133</b>                    | <b>11%</b>                  | <b>754,190</b>                    | <b>32%</b>                  | <b>882,757</b>                    | <b>55%</b>                  |

## BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Developing realistic GHG emission forecasts is a critical step in preparing a CAP. Emission forecasts estimate future emissions levels and provide insight regarding the scale of reductions necessary to achieve an emissions target. The County has prepared GHG forecasts for 2020, 2035, and 2050 horizon years.

The County's jurisdictional emissions are forecasted to be 632,133 MT CO<sub>2</sub>e in 2020, 754,190 MT CO<sub>2</sub>e in 2035, and 882,757 MT CO<sub>2</sub>e in 2050, representing growth of 11%, 32%, and 55%, respectively, from the 2008 baseline emissions. Table 2.1 shows that while emissions are forecasted to increase in all sectors, transportation-related emissions are anticipated to increase at a greater rate than other sectors.

The forecasts were established using sector-specific growth factors (e.g., energy demand forecasts) or the County's population and employment growth projections. When based on population and employment growth projections, the GHG forecasts assume that baseline year activity intensity (e.g., waste generation per capita) will continue into the future. The business-as-usual GHG forecasts do not include emission reductions associated with State GHG reduction programs or implementation of the local actions described in this CAP.

The forecasts were developed for planning purposes, and represent the best-available estimates. Given the complexity of each emissions sector and the unpredictable nature of market conditions, human behavior and demographics, they will need to be updated in the future as data becomes available. The County will reevaluate the forecasts throughout the CAP implementation process.

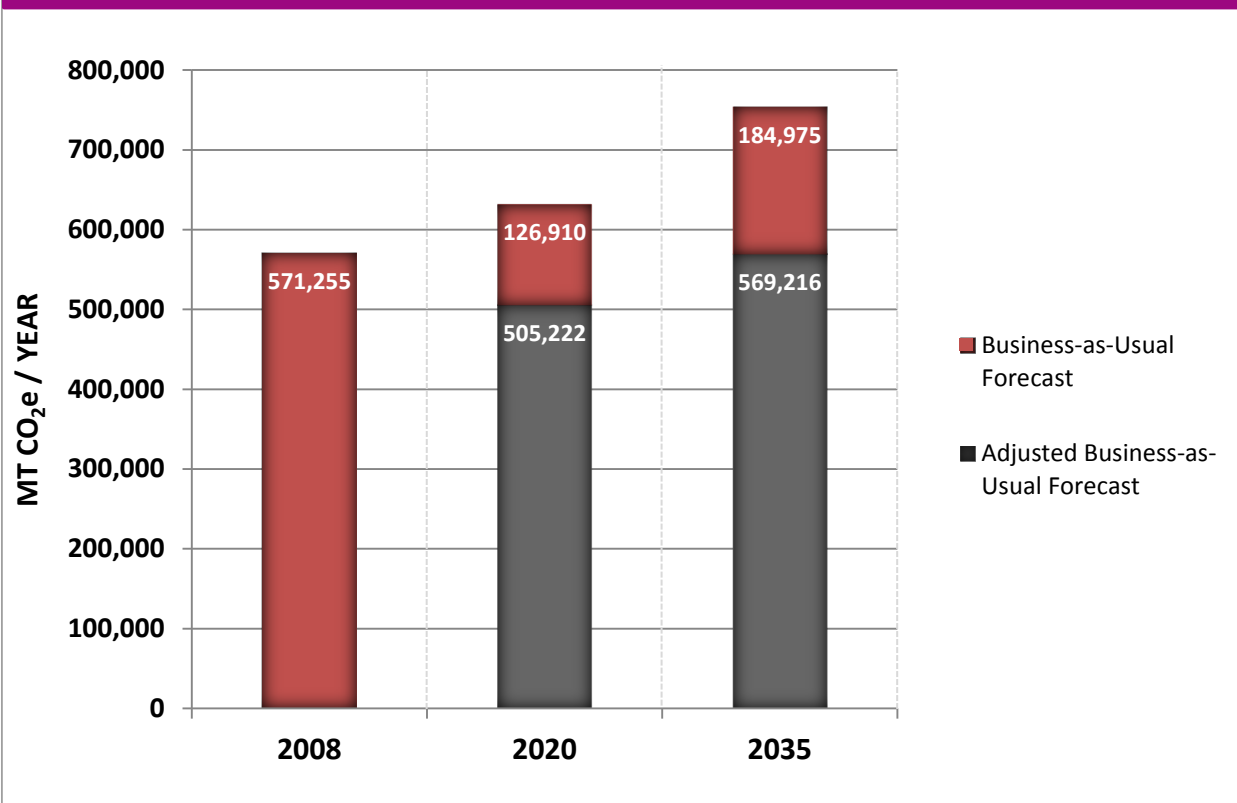
### ADJUSTED BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Table 2.2 describes the emission reductions anticipated to occur within the community through implementation of State and federal policies and regulations. The largest anticipated reductions are from State and federal fuel efficiency improvements to passenger vehicles and light-duty trucks. As residents and businesses replace older vehicles with newer ones, people will consume less fuel and generate fewer emissions per vehicle mile traveled. California's low carbon fuel standard will also reduce transportation-related emissions in the community by requiring a transition away from fossil fuels (i.e., gasoline and diesel) toward lower-carbon bio-fuels (e.g., ethanol). Implementation of the regional SB 375 Sustainable Communities Strategy will reduce vehicle emissions through development of effective transit and other alternative transportation systems and encouragement of low-carbon development. California law also requires all utilities to obtain 33% of their electricity from renewable energy sources by 2020. In 2008, about 12% of PG&E's portfolio was generated from renewable sources. This increase in renewable electricity will reduce the community energy-related emissions. The medium- and heavy-duty vehicle efficiency improvements program and California Energy Code (Title-24) requirements for new construction will create smaller, but still important, communitywide emission reductions.

State and federal actions that reduce communitywide emissions in unincorporated Shasta County will make it easier for the community to achieve 2020 and 2035 emission reduction goals. As shown in Table 2.2 and Figure 2.3, with implementation of State and federal actions, communitywide emissions would be 505,222 MT CO<sub>2</sub>e/yr in 2020 and 569,216 MT CO<sub>2</sub>e/year in 2035.

**Table 2.2 – Emission Reductions from State Actions 2020 and 2035**

| State Action   | 2020 Reduction<br>(MT CO <sub>2</sub> e/year) | 2035 Reduction<br>(MT CO <sub>2</sub> e/year) |
|--|---|---|
| Passenger vehicle and light-duty truck fuel efficiency standards | 35,421  | 66,274  |
| Low Carbon fuel standard   | 15,173  | 16,146  |
| Non-Pavley passenger vehicle efficiency programs                 | 6,950   | 8,384   |
| Medium- and heavy-duty vehicle efficiency improvement program    | 1,686   | 2,096   |
| SB 375   | 21,208  | 45,065  |
| 2008 and 2013 California Title-24 standards                      | 639   | 1,177   |
| Renewable portfolio standard (33% by 2020)                       | 45,832  | 45,832  |
| <b>Total</b>   | <b>126,910</b>                                | <b>184,975</b>                                |

**FIGURE 2.3 - BUSINESS-AS-USUAL & ADJUSTED BUSINESS-AS-USUAL EMISSIONS**

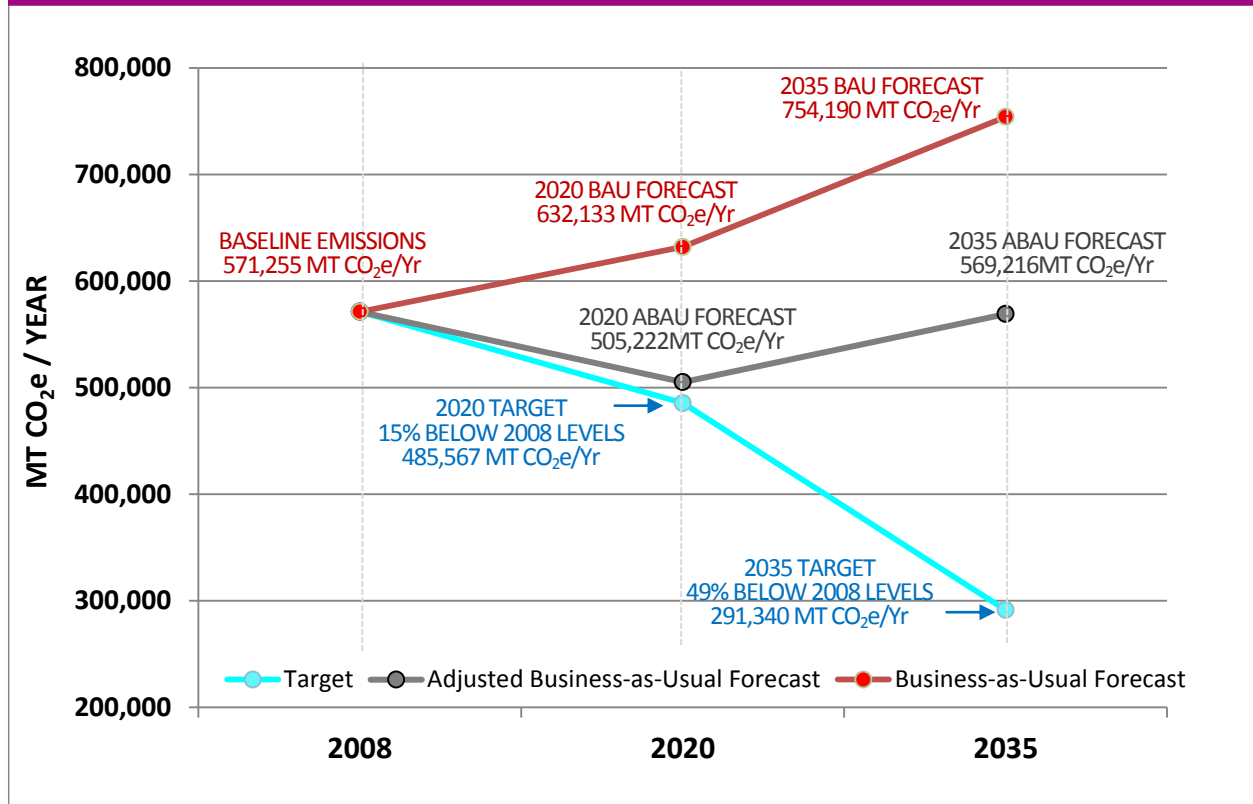
## GREENHOUSE GAS EMISSION REDUCTION TARGETS

The County has selected emission reduction targets that are both ambitious and practical. The targets will allow the County to contribute to State climate protection efforts and are purposely set at levels that are likely to provide CEQA streamlining benefits to new development projects in the community. Unincorporated Shasta County's GHG reduction targets are as follows:

- Reduce community emissions to 15% below 2008 levels by 2020 (485,567 MT CO<sub>2</sub>e/yr)
- Reduce community emissions to 49% below 2008 levels by 2035 (291,340 MT CO<sub>2</sub>e/yr)
- Reduce community emissions to 83% below 2008 levels by 2050 (97,113 MT CO<sub>2</sub>e/yr)

The California Global Solutions Warming Act (AB 32) requires the State to reduce statewide GHG emissions to 1990 levels by 2020. The County selected its 2020 target in order to contribute the community's fair share to this near-term effort. This target aligns with direction provided by the California Air Resources Board. Executive Order S-03-05 directs the State to reduce emissions to 80% below 1990 levels by 2050. In order to contribute to this long-term effort, the County strives to achieve an equivalent goal of reducing community emissions to 83% below 2008 levels in the same time period. To be on a path toward that goal, the County will need to reduce emissions to a level 49% below 2008 by 2035. Calculations showing the logic of this interim goal can be examined in Appendix C.

This CAP describes measures that can achieve the 2020 reduction target and work toward the 2035 target. While the County supports the goal of Executive Order S-03-05, it recognizes that estimating 2050 emission levels and reduction potentials are highly speculative. For this reason, the County has chosen not to focus on the 2050 reduction target at this time. The County will regularly re-evaluate its long-term GHG reduction efforts to reflect future conditions and adjust emission reduction measures accordingly.

**FIGURE 2.4 - GREENHOUSE GAS REDUCTION TARGETS 2020 & 2035**

## GREENHOUSE GAS EMISSION REDUCTION MEASURES

To meet its adopted emissions reduction targets, the County will implement policies, programs, and other projects related to energy, waste, water, transportation, and carbon sequestration. This section provides a summary of the CAP's overall emissions reduction potential and describes the measures that the County will use to implement the local actions.

### SUMMARY OF REDUCTIONS

Table 2.3 describes the emissions reduction potential of the County's adopted CAP measures. In 2020, local actions are anticipated to reduce approximately 28,097 MT CO<sub>2</sub>e/yr. The waste-related measures are expected to provide the largest portion, 63%, of the local reductions. The energy-related measures will provide around 36%, followed by transportation (0.7%), water (0.3%), and carbon sequestration (0.1%). Table 2.4 and Figure 2.5 illustrate that together the local and state actions are expected to reduce communitywide emissions to approximately 16.5% below 2008 baseline emissions levels, surpassing the adopted 2020 target (15% below 2008 levels) by more than 8,000 MT CO<sub>2</sub>e/yr. This estimated level of reduction conforms to the CEQA requirements for a qualified GHG reduction strategy and can be expected to provide streamlining benefits for compliant projects constructed within the jurisdiction prior to 2020.

In 2035, local actions are anticipated to reduce approximately 54,734 MT CO<sub>2</sub>e/yr. The source of reductions is very similar to those in 2020, with waste and energy-related measures contributing the two highest proportions. Local and state actions are expected to reduce communitywide emissions to

approximately 9.9% below 2008 baseline emissions levels; a level that falls short of the County's adopted 2035 target (49% below 2008 levels). The County anticipates that new technologies and State or federal policies will be developed and will assist the community to achieve this longer-term goal.

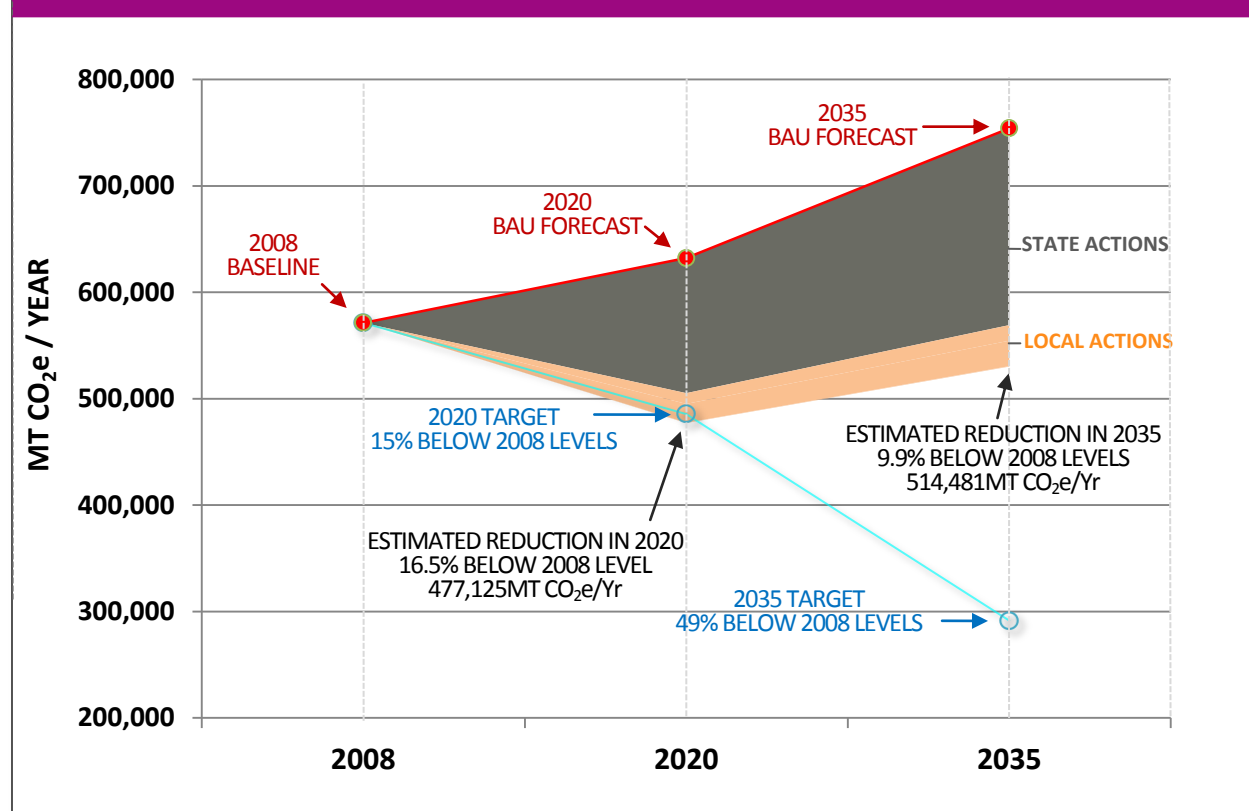
**Table 2.3 – Quantified Greenhouse Gas Reductions**

| Sectors and Measures                 |   | 2020<br>(MT CO <sub>2</sub> e/yr) | 2035<br>(MT CO <sub>2</sub> e/yr) |
|--------------------------------------|---|-----------------------------------|-----------------------------------|
| <b>Building Energy</b>               |   |                                   |                                   |
| BE-1                                 | Existing Buildings                        | 201                               | 452                               |
| BE-2                                 | New Construction                          | 0                                 | 0                                 |
| BE-3                                 | Commercial Indoor Lighting                | 24                                | 65                                |
| BE-4                                 | Energy-Efficient Appliances               | 1,443                             | 9,459                             |
| BE-5                                 | Smart Grid Integration                    | 1,214                             | 2,731                             |
| BE-6                                 | Solar Water Heaters                       | 886                               | 2,336                             |
| BE-7                                 | Solar Photovoltaic Systems                | 6,315                             | 15,400                            |
| <b>Subtotal</b>                      |   | <b>10,082</b>                     | <b>30,443</b>                     |
| <b>Water</b>                         |   |                                   |                                   |
| W-1                                  | Residential Fixture and Fittings Retrofit | 94                                | 206                               |
| <b>Subtotal</b>                      |   | <b>94</b>                         | <b>206</b>                        |
| <b>Solid Waste</b>                   |   |                                   |                                   |
| SW-1                                 | Lumber Waste Diversion Ordinance          | 1,334                             | 3,495                             |
| SW-2                                 | Methane Recovery                          | 16,360                            | 20,051                            |
| <b>Subtotal</b>                      |   | <b>17,694</b>                     | <b>23,546</b>                     |
| <b>Transportation</b>                |   |                                   |                                   |
| T-1                                  | Bicycle Lane Expansion                    | 127                               | 354                               |
| T-2                                  | Commute Trip Reduction                    | 70                                | 116                               |
| <b>Subtotal</b>                      |   | <b>197</b>                        | <b>469</b>                        |
| <b>Carbon Sequestration</b>          |   |                                   |                                   |
| GI-1                                 | Urban Forest                              | 30                                | 70                                |
| <b>Subtotal</b>                      |   | <b>30</b>                         | <b>70</b>                         |
| <b>TOTAL LOCAL ACTION REDUCTIONS</b> |   | <b>28,097</b>                     | <b>54,734</b>                     |

**Table 2.4 - Reduction Potential of County's CAP Measures**

|  | 2008     | 2020                          |                      |                           | 2035                          |                      |                           |
|--|----------|-------------------------------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|
|  | Baseline | BAU                           | ABAU                 | ABAU + Local CAP Measures | BAU                           | ABAU                 | ABAU + Local CAP Measures |
| <b>GHG Emissions (MT CO<sub>2</sub>e/Yr)</b> | 571,255  | 632,133                       | 505,222              | 477,126                   | 754,190                       | 569,216              | 514,481                   |
| <b>Change from Baseline</b>                  | NA       | 10.7%                         | -11.6%               | -16.5%                    | 32.0%                         | -0.4%                | -9.9%                     |
| <b>CAP GHG Reduction Targets</b>             | NA       | Target = 15% below 2008 level | Does Not Meet Target | <b>Meets Target</b>       | Target = 49% below 2008 level | Does Not Meet Target | Does Not Meet Target      |

Figure 2.5 demonstrates the relative contribution of State and the County's local actions. While the State actions provide the majority of reductions in 2020, the local actions are necessary to achieve the target. In 2035, State and local reductions increase in scale, but do not provide enough reductions to counteract the community's forecasted emissions growth or the more aggressive 2035 target.

**FIGURE 2.5: EMISSIONS REDUCTION POTENTIAL OF STATE AND LOCAL ACTIONS**

## REDUCTION MEASURES

The CAP measures define the programs, policies, and projects that the County will undertake to accomplish its emission reduction objectives. Within this section, the measures are organized into five categories including: energy, water, waste, transportation, and carbon sequestration. Each category begins with an introduction followed by its corresponding reduction measures.

### Measure Structure

To aid the reader and to facilitate implementation of the CAP, each measure contains the following information:

- **Emission Reductions** - Reduction potential values are provided after each measure title, and identify the estimated annual emission reductions anticipated in 2020 and 2035 in MT CO<sub>2</sub>e/yr. All measures have a quantifiable GHG reduction potential.
- **Description** - Measure descriptions provide important background information and describe the County's rationale and policy direction. Additionally, some descriptions provide guidance that will be used in program implementation or highlight the County's actions to date that relate to a particular measure.
- **Actions and Progress Indicators** - Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the County will take to implement the measure. The table also identifies responsible departments. Progress indicators enable staff, the Board of Supervisors, and the public to track implementation and monitor overall CAP progress. Specific progress indicators are provided for both 2020 and 2035.

### ENERGY MEASURES:

The use of electricity and natural gas within residential, commercial, and industrial buildings generated over 36% of unincorporated Shasta County's communitywide GHG emissions in 2008. The energy measures described on the following pages recommend ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase the use of renewable energy.



### Measure BE-1: Existing Buildings

**2020 GHG Reduction Potential:** 201 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 451 MT CO<sub>2</sub>e/yr

Sixty percent of houses in unincorporated Shasta County were built before 1980, and therefore prior to adoption of California's Title 24 energy efficiency requirements. In addition, approximately 95% of housing units and 85% of non-residential square footage that is projected to exist in unincorporated Shasta County in 2020 has already been constructed as of 2008. Energy efficiency retrofits should be targeted to help residents reduce their utility bills and the County's building-related emissions. Utility companies and private contractors can assess a building's efficiency through an energy audit, and identify gaps in the building envelope through which heating and cooling escape. Audits can also help homeowners and building owners to prioritize retrofit investments to maximize their financial returns.



In the past, the County has advertised the PG&E energy efficiency audit program and weatherization assistance and rebate programs to its residents and business owners. PG&E currently offers a variety of rebates for installing energy-efficient features, including:

- cool roofs,
- attic and wall insulation,
- cooling and heating equipment, and
- swimming pool pumps.

PG&E also offers rebates on whole-house packages for homeowners that wish to address energy efficiency holistically.

The Energy Upgrade California website ([www.energyupgradeca.org](http://www.energyupgradeca.org)) is another resource to identify rebates and incentive programs throughout the state. There are currently over 50 programs available to Shasta County residents, which are funded by utility companies and state agencies. Incentives and rebates are available to help home and business owners improve efficiency in the following areas:

- air and duct sealing;
- attic, wall, and hot water pipe insulation;
- water-efficient fixtures (e.g., low-flow shower heads);
- HVAC upgrades (e.g., air conditioners, whole house fans, ducted evaporative cooling systems, ceiling fans);
- cool roofs;
- hot water heaters/blankets;
- indoor lighting; and
- ENERGY STAR appliances (e.g., dishwashers, refrigerators, freezers).

The County will develop a comprehensive public outreach campaign to provide information on the benefits of energy efficiency improvements. The outreach campaign should present the simple cost payback calculations associated with common efficiency upgrades, explain how building energy audits can help identify cost-effective upgrade options, and provide information on existing rebates and incentive programs.

| ACTION  | RESPONSIBILITY      |
|---|---------------------|
| <b>Short-Term</b>   |                     |
| <b>A</b> Continue to promote PG&E incentives and energy conservation programs for older homes.  | Resource Management |
| <b>B</b> Develop comprehensive public outreach campaign promoting energy-efficiency improvements.   | Resource Management |
| PROGRESS INDICATORS   | YEAR                |
| <b>1</b> 2% of existing residential buildings implement energy efficiency retrofits and 10% of existing non-residential buildings implement energy efficiency retrofits     | 2020                |
| <b>2</b> 4.5% of existing residential buildings implement energy efficiency retrofits and 22.5% of existing non-residential buildings implement energy efficiency retrofits | 2035                |



## Measure BE-2: New Construction

**2020 GHG Reduction Potential:** Contained within Title-24 in Statewide

**2035 GHG Reduction Potential:** Contained within Title-24 in Statewide

Energy consumption represents the second largest emissions sector in unincorporated Shasta County's emissions inventory. Constructing new buildings and retrofitting existing buildings in a way that reduces their energy use, will result in fewer emissions. Energy efficient building design and construction can help reduce heating needs in the winter and cooling needs in the summer.

The 2010 CalGreen Building Code (CalGreen) sets guidance for higher building performance standards. CalGreen offers two voluntary compliance pathways to achieve 15% and 30% energy efficiency above the State's 2008 Title 24 Energy Code efficiency requirements. Contingent upon funding availability, the County will develop priority permitting to new residential projects that demonstrate 15% higher energy efficiency than Title 24 requirements. These efforts will serve to increase energy efficiency of new residential buildings and would help to lower homeowners utility bills.

Additional energy savings are anticipated to be created through the 2013 update of the State's Title 24 standards. All new construction developed between 2010 and 2015 has been, or will be, required to meet the 2008 Title-24 requirements. All new construction developed between 2015 and 2020 will be required to comply with the updated 2013 Title 24 requirements that the California Energy Commission estimates will be 20-25% more energy efficient than the 2008 standards. The County anticipates that more than 50% of all new construction in the County will be subject to the 2013 Title 24 standards. The unincorporated Shasta County CAP includes reductions associated with the 2008 and 2013 Title 24 standards with the statewide reductions (see appendix B for details). Further increases in Title 24 standards are anticipated after 2017 but are too speculative at this point in time to quantify.

Because the State develops the Title 24 standards for each code period with the goal of balancing energy efficiency and cost-effectiveness, the County believes it is not prudent to require efficiency at a level higher than the State's standard. The County will not adopt an efficiency standard more stringent than the State's code.

| ACTION  | RESPONSIBILITY |
|---|----------------|
| <b>Short-Term</b>   |                |
| A Develop a priority permitting program for new residential projects that demonstrate 15% higher efficiency than Title 24 requirements.                   | Building       |
| PROGRESS INDICATORS   | YEAR           |
| 1 50% of new residential (i.e., single-family and multi-family) and non-residential construction achieves 25% reduction in energy use above 2008 Title-24 | 2020           |
| 2 75% of new residential (i.e., single-family and multi-family) and non-residential construction achieves 25% reduction in energy use above 2008 Title-24 | 2035           |



## Measure BE-3: Commercial Indoor Lighting

**2020 GHG Reduction Potential:** 24 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 65 MT CO<sub>2</sub>e/yr

There is approximately 700,000 square feet of non-residential building space in unincorporated Shasta County. Conventional commercial lighting used to illuminate these buildings, including T12 fluorescent bulbs, consumes more energy than new T8 lights, light-emitting diodes (LED), and other efficient lighting technologies. Retrofitting existing commercial interior lighting is a relatively easy upgrade to make, and rebate programs are available to reduce the already short simple-payback period. PG&E's lighting upgrade program includes rebates for fixtures, lamps, accent/directional lighting, controls and occupancy sensors, and signage.

The County will work with non-residential developers during the building permit phase to ensure that applicable rebate programs are used to their greatest effect. The County will also provide targeted outreach and technical assistance to owners/managers of large (i.e., > 50,000 sqft), non-residential buildings to encourage participation in PG&E's lighting upgrade program. The County's outreach will include a description of the short payback period associated with lighting upgrade improvements.

| ACTION   | RESPONSIBILITY      |
|--|---------------------|
| <b>Short-Term</b>  |                     |
| <b>A</b> Discuss applicable rebates and incentive programs with building developers during the building permit phase | Building            |
| <b>B</b> Provided targeted outreach to building owners/managers of large non-residential buildings                   | Resource Management |
| PROGRESS INDICATORS  | YEAR                |
| <b>1</b> 10% of non-residential buildings reduce indoor lighting load by 40%   | 2020                |
| <b>2</b> 22.5% of non-residential buildings reduce indoor lighting load by 40%                                       | 2035                |



## Measure BE-4: Energy-Efficient Appliances

**2020 GHG Reduction Potential:** 1,443 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 9,459 MT CO<sub>2</sub>e/yr

As building shells and systems become increasingly efficient, addressing energy consumption from appliances and electronics will become more important in reducing building energy use and residents' utility bills. Installing ENERGY STAR appliances is one way to address this type of energy use. The ENERGY STAR rating is an internationally recognized standard for energy-efficient consumer products. According to the EPA, devices that have an ENERGY STAR certification, such as dishwashers, refrigerators, and washing machines, generally use 20% to 30% less energy than required by federal standards. In 2006, approximately 30% of refrigerators, 40% of clothes washers, and 90% of dishwashers sold nationwide were ENERGY STAR-certified appliances. PG&E offers rebates to its customers for the purchase of qualifying energy-efficient appliances.

The County will partner with PG&E and other organizations to promote existing financial incentives and rebates for energy-efficient appliance upgrades and replacements in both new and existing residential units. Successful implementation of this measure requires a broad public outreach campaign to reach all segments of the community. The County will identify community events at which it can staff an informational table to advertise energy-efficiency rebates and incentives, including farmers' markets, Burney Basin Days, the Strawberry festival, and the Shasta County Fair. The County will also work with PG&E to include informational inserts in utility bills that advertise PG&E's existing rebate programs and the simple cost payback associated with replacing inefficient appliances. Targeted outreach should also be provided to the building community at the building permit phase, and to homebuyers and renters through a partnership with local realtors and property managers.

| ACTION  | RESPONSIBILITY      |
|---|---------------------|
| <b>Short-Term</b>   |                     |
| <b>A</b> Collaborate with PG&E to promote existing financial incentives programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances | Resource Management |
| <b>B</b> Advertise energy-efficient appliance rebates at community events   | Resource Management |
| PROGRESS INDICATORS   | YEAR                |
| <b>1</b> New homes install ENERGY STAR appliances at the following rates: 40% refrigerators, 40% clothes washers, and 70% dishwashers   | 2020                |
| <b>2</b> Existing homes replace ENERGY STAR appliances at the following rates: 20% refrigerators, 20% clothes washers, and 20% dishwashers                                    | 2020                |
| <b>3</b> New homes install ENERGY STAR appliances at the following rates: 90% refrigerators, 90% clothes washers, and 90% dishwashers   | 2035                |
| <b>4</b> Existing homes replace ENERGY STAR appliances at the following rates: 90% refrigerators, 90% clothes washers, and 90% dishwashers                                    | 2035                |



## Measure BE-5: Smart Grid Integration

**2020 GHG Reduction Potential:** 1,214 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 2,731 MT CO<sub>2</sub>e/yr

The smart grid is an emerging energy management system, which combines information technology with renewable energy to improve how electricity is generated, delivered, and consumed. The smart grid will reduce energy demand, improve integration of distributed energy production (e.g., rooftop solar panels), and increase electricity transmission and distribution efficiency. These changes will help residents and businesses save energy, and can reduce GHG emissions associated with energy production. The first step in saving energy from the smart grid is to install smart meters, which allow customers to track their home or businesses' energy use throughout the day. In 2011, PG&E began installing smart meters in homes and businesses throughout Shasta County. The value of the smart grid does not end at the meter, however; its full value is realized when it extends into technologies used in homes and businesses. For example, smart appliances can be programmed to operate during off-peak hours when electricity prices are cheaper.

The County will encourage voluntary adoption of smart grid technology in new and existing construction, promoting the use of smart appliances in homes and businesses. The County will develop an outreach campaign highlighting the benefits of smart grid integration that can occur following smart meter installation. The outreach campaign should describe how energy management systems work inside a building, including internet-based displays (e.g., smart phone applications) that show how much energy is being used and smart appliances that can defer discretionary electricity use to off-peak hours.

| ACTION   | RESPONSIBILITY      |
|--|---------------------|
| <b>Short-Term</b>  |                     |
| A Develop an outreach program with PG&E that informs property owners and businesses about smart grid and smart appliance technologies, as well as energy conservation opportunities using smart meter technology | Resource Management |
| PROGRESS INDICATORS  | YEAR                |
| 1 10% of existing residential and commercial customers adopt smart-grid technology   | 2020                |
| 2 30% of new residential and commercial customers adopt smart-grid technology  | 2020                |
| 3 22.5% of existing residential and commercial customers adopt smart-grid technology   | 2035                |
| 4 67.5% of new residential and commercial customers adopt smart-grid technology  | 2035                |



## Measure BE-6: Solar Water Heaters

**2020 GHG Reduction Potential:** 886 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 2,336 MT CO<sub>2</sub>e/yr

Shasta County's location and geography result in a relatively high solar insolation rating (comparable to southern cities, such as Orlando, FL and New Orleans, LA), which makes it an excellent candidate for effective adoption of solar technologies. Solar water heaters (SWH) systems can reduce the amount of natural gas or electricity used to heat water in conventional systems and thereby reduces energy-related GHG emissions. However, the high capital cost of SWH systems can pose a financial burden to building owners. A number of financing options can reduce up-front costs, such as on-bill financing, low-interest loans, and rebates under the California Solar Initiative (CSI). Through the CSI-Thermal Program, single-family homeowners are eligible for SWH rebates of up to \$1,875. Non-residential customers who install certified SWH systems can qualify for incentives of up to \$500,000 to offset capital costs. Incentive levels will decline in four stages as the solar thermal market grows. Actual incentive payments will be determined by the thermal output of the system.

The County will actively promote and facilitate the installation of SWH systems on buildings and for private swimming pools through an outreach program describing currently available CSI-Thermal Program rebates. The County will collaborate with PG&E and other non-profit organizations to identify additional local, State, or national financing options. The County will also provide permit streamlining and fee reductions related to the installation of SWH systems as a further incentive.

| ACTION   | RESPONSIBILITY      |
|--|---------------------|
| <b>Short-Term</b>  |                     |
| <b>A</b> Work with PG&E and California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential and commercial buildings | Resource Management |
| <b>B</b> Encourage the use of California Solar Initiative, US EPA, PG&E, and other rebates for solar hot water heaters   | Resource Management |
| <b>C</b> Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation  | Building            |
| <b>D</b> Reduce or waive fees associated with installation of solar water heaters  | Building            |
| PROGRESS INDICATORS  | YEAR                |
| <b>1</b> 5% each of single-family residential buildings, multi-family residential buildings, and non-residential buildings install a solar hot water system                        | 2020                |
| <b>2</b> 11.3% each of single-family residential buildings, multi-family residential buildings, and non-residential buildings install a solar hot water system                     | 2035                |



## Measure BE-7: Solar Photovoltaic Systems

**2020 GHG Reduction Potential:** 6,315 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 15,400 MT CO<sub>2</sub>e/yr

As mentioned in Measure BE-6, Shasta County is a good candidate for solar technologies based on its relatively high solar insolation level. Installation of residential solar photovoltaic (PV) systems allows homeowners to take advantage of cost-saving renewable energy. In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for larger PV systems. Parking lots also provide excellent opportunities for additional solar energy generation. However, numerous barriers may prevent widespread adoption of solar PV technology: County regulations, up-front costs, misinformation or lack of information.

Various options are available to assist residents and businesses in overcoming the financial burdens associated with PV installation, including rebates, incentives, and solar service providers. The California Solar Initiative ([www.gosolarcalifornia.org](http://www.gosolarcalifornia.org)) offers rebates for small PV units of 30kW and less, which are suitable for households and small businesses, as well as rebates for larger systems. Specific rebate programs target existing homes, low-income and affordable multi-family buildings, and low-income and affordable single-family houses. Solar service providers allow residents and businesses to enjoy the price-saving benefits of solar energy with little to no upfront costs by offering solar PV system design, finance, installation, and maintenance to residential and commercial customers. Customers have the option to purchase or lease a PV system or enter into a power purchase agreement (PPA) with a provider, in which they lock in their solar energy rates for the duration of their PPA contract. Customers who lease a system or enter a PPA can do so with no upfront cost; the provider installs, owns, maintains, and insures the PV system for the duration of the contract.

The County will develop a multi-pronged approach to remove barriers to PV installation. The County will review its regulations, ordinances, and codes to identify any barriers to solar project installation. The County will develop a solar outreach campaign that encourages property owners to install PV

systems through streamlined permitting, reduced permitting fees, technical assistance, and information on currently available rebates or incentive programs. The County will also actively encourage residents and business owners to take advantage of cost-saving solar service providers that operate in the area.

| ACTION  | RESPONSIBILITY      |
|---|---------------------|
| <b>Short-Term</b>   |                     |
| <b>A</b> Remove regulatory barriers to installation of PV systems   | Building            |
| <b>B</b> Provide streamlined permitting and reduce permitting fees related to installation of PV systems  | Building            |
| <b>C</b> Develop public outreach campaign that explains benefits of PV systems, highlights available rebates/incentives, explains PPAs and identifies solar service providers in the area | Resource Management |
| PROGRESS INDICATORS   | YEAR                |
| <b>1</b> 10% of single-family residential units install a rooftop PV system<br>County government installs 6.5 MW of solar power   | 2020                |
| <b>2</b> 22.5% of single-family residential units install a rooftop PV system<br>County government installs 15 MW of solar power  | 2020                |

## WATER MEASURES:

The water sector generated approximately 2% of unincorporated Shasta County's communitywide GHG emissions in 2008, primarily through electric water pump use to supply potable water to residents and businesses. The following water-related measure recommends ways to reduce residential indoor water use through installation of efficient fixtures and appliances.



## Measure W-1: Residential Fixture and Fittings Retrofit

**2020 GHG Reduction Potential:** 94 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 206 MT CO<sub>2</sub>e/yr

Sixty percent of houses in unincorporated Shasta County are more than 30 years old, and water fixtures and appliances have improved considerably since these units were built. Replacing plumbing fixtures in older houses can provide water conservation benefits (and electricity savings where private wells are used), which translate into lower utility bills for homeowners. Reducing water demand also results in fewer emissions because less energy is used to pump, treat, deliver, and collect water and wastewater. Common fixture and appliance replacements include toilets, showerheads, faucets, dishwashers, and clothes washers.

The County will provide information to residents during the building permit phase that describes the benefits of installing high-efficiency fixtures, fittings, and appliances. The County will also identify any applicable rebates from utility providers or agencies and provide that information on the Shasta County Water Agencies webpage.

| ACTION              |   | RESPONSIBILITY      |
|---------------------|---|---------------------|
| <b>Short-Term</b>   |   |                     |
| <b>A</b>            | Develop informational materials that describe benefits of installing high-efficiency water fixtures/appliances          | Building            |
| <b>B</b>            | Identify water efficiency rebates or incentives applicable to unincorporated Shasta County residents                    | Resource Management |
| PROGRESS INDICATORS |   | YEAR                |
| <b>1</b>            | 5% of residential households install high-efficiency toilets, showerheads, faucets, dishwashers, and clothes washers    | 2020                |
| <b>2</b>            | 11.3% of residential households install high-efficiency toilets, showerheads, faucets, dishwashers, and clothes washers | 2035                |

### WASTE MEASURES:

The decomposition of the community's solid waste in landfills generated approximately 5% of unincorporated Shasta County's communitywide GHG emissions in 2008. The waste-related measures described on the following pages recommend ways to increase diversion of organic wastes and describe the County's implementation of enhanced landfill methane capture systems.



## Measure SW-1: Lumber Waste Diversion Ordinance

**2020 GHG Reduction Potential:** 1,334 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 3,495 MT CO<sub>2</sub>e/yr

Construction and demolition waste made up 29% of the statewide waste stream in 2008. However, various construction materials can be salvaged during the demolition process for reuse or recycling, including, concrete, bricks, lumber, metal, and drywall. Diverting materials from the waste stream increases the longevity of landfills, and in the case of organic materials, reduces landfill-related methane emissions.

The County will adopt a construction and demolition lumber waste diversion ordinance that applies to new construction and renovations. The ordinance will require 75% of lumber waste to be diverted from the waste stream. CalRecycle provides guidance on developing construction and demolition waste diversion ordinance language to facilitate implementation.

| ACTION              |  | RESPONSIBILITY |
|---------------------|--|----------------|
| <b>Short-Term</b>   |  |                |
| <b>A</b>            | Adopt 75% lumber diversion ordinance applicable to residential and commercial construction and renovation projects | Building       |
| PROGRESS INDICATORS |  | YEAR           |
| <b>1</b>            | 100% of residential and commercial projects participate in 75% lumber waste diversion                              | 2020           |
| <b>2</b>            | 100% of residential and commercial projects participate in 75% lumber waste diversion                              | 2035           |





## Measure SW-2: Methane Recovery

**2020 GHG Reduction Potential:** 16,360 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 20,051 MT CO<sub>2</sub>e/yr

The Air Resources Board approved a regulation to reduce methane emissions from municipal solid waste landfills as an early implementing action of AB 32. Per the regulation, methane capture facilities have been required at all municipal solid waste landfills since June 2010. Two landfills are used in Shasta County to dispose of waste from unincorporated County residents: the West Central Landfill and the Anderson Landfill. The West Central Landfill is currently an uncontrolled municipal solid waste landfill, meaning there is no methane capture infrastructure in place. However, the County is in the process of constructing a gas control system that would capture landfill-generated methane and direct it to a flare where it would be burned off, dramatically reducing the global warming potential of the gas. In the future, this system may be upgraded to a landfill gas-to-energy system under which an operator could construct a power plant to capture the landfill methane and burn it to generate electricity. The Anderson Landfill currently has a methane capture system in place with no plans for system upgrades.

The County will complete installation of the methane capture facility at the West Central Landfill. The County will also continue to explore the feasibility of installing a landfill gas-to-energy system at the landfill through a partnership with an independent energy provider.

| ACTION  | RESPONSIBILITY |
|---|----------------|
| <b>Short-Term</b>   |                |
| <b>A</b> Complete installation of methane capture facilities at West Central Landfill                         | Public Works   |
| <b>B</b> Evaluate future proposals for construction of landfill energy-to-gas system at West Central Landfill | Public Works   |
| PROGRESS INDICATORS   | YEAR           |
| <b>1</b> Methane recovery efficiency at West Central Landfill improved from 0% to 75%                         | 2020           |
| <b>2</b> Methane recovery efficiency at West Central Landfill continued at 75%                                | 2035           |

### TRANSPORTATION/LAND USE MEASURES:

The use of motor vehicles for transporting people and products generated approximately 43% of unincorporated Shasta County's communitywide GHG emissions in 2008. The transportation-related measures described on the following pages describe the County's efforts to reduce auto-dependence in new development and improve biking and walking infrastructure within the community.



## Measure T-1: Bicycle Lane Expansion

**2020 GHG Reduction Potential:** 127 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 354 MT CO<sub>2</sub>e/yr

Unincorporated Shasta County currently has approximately 3.0 miles of bicycle lanes. The *Shasta County 2010 Bicycle Transportation Plan* (BTP) proposes an additional 88.0 miles of bicycle lanes to connect major employers and points of interest within the County, including Shasta College, schools, and community centers. The BTP also encourages the provision of end-of-trip facilities, such as bicycle lockers, showers, and changing facilities, at public and private employers. It also encourages bicycle racks to be installed at all County schools, major employers, and within the County's community centers to facilitate bicycle commuting.

The County will identify and pursue funding sources to implement the BTP. The County will construct the proposed 86.0 miles of bike paths as funding becomes available with priority given to projects that connect major activity centers (e.g., schools, large employers, community centers) with residential neighborhoods. The County will also encourage non-residential developers to incorporate end-of-trip facilities in projects that include employment centers.

| ACTION  | RESPONSIBILITY   |
|---|--|
| <b>Short-Term</b>   |  |
| <b>A</b> Pursue funding to implement Bicycle Transportation Plan; construct proposed bicycle paths                | Resource Management<br>Public Works Department<br>SRTA |
| <b>B</b> Discuss benefits of providing end-of-trip facilities at large employment centers with project developers | Planning; Building                                     |
| PROGRESS INDICATORS   | YEAR   |
| <b>1</b> 43 miles of bicycle paths constructed  | 2020   |
| <b>2</b> 97 miles of bicycle paths constructed  | 2035   |



## Measure T-2: Commute Trip Reduction

**2020 GHG Reduction Potential:** 70 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 116 MT CO<sub>2</sub>e/yr

Approximately 92% of unincorporated Shasta County residents commute to work by automobile. The remaining 8% commute by a variety of methods, including public transportation, carpooling, bicycling, walking, and telecommuting. Social media websites and other internet-based technologies can facilitate ridesharing by connecting interested drivers and passengers. Strategic facility improvements at important public transportation nodes can also increase ridership by removing some of the perceived barriers (e.g., unpredictable arrival/departure times, unsafe/unmarked bus stops). Increasing carpooling and public transit use will reduce the total vehicle miles traveled by County

residents, resulting in fewer GHG emissions.

The County will work with SRTA and other agencies to facilitate ridesharing opportunities, including carpooling and vanpooling. Specifically, the County will work with partners to develop ride-matching systems to use current technologies (e.g., cell phone-enabled ride-match applications), and develop a ride-match social networking website and online electronic payment options. The County and RTPA will also evaluate the need for additional park-and-ride lots, and will pursue funding for bus stop improvements, including shelters, seating, and electronic signage.

| ACTION  | RESPONSIBILITY              |
|---|-----------------------------|
| <b>Short-Term</b>   |                             |
| <b>A</b> Develop a ride-matching website  | Resource Management<br>SRTA |
| <b>B</b> Identify transit stops in high-activity areas that would benefit from additional enhancements (e.g., shelter, seating, electronic arrival/departure information) | SRTA                        |
| <b>C</b> Pursue funding for transit stop improvements   | SRTA                        |
| PROGRESS INDICATORS   | YEAR                        |
| <b>1</b> 5% of employees in unincorporated Shasta County commute via carpool or public transit  | 2020                        |
| <b>2</b> 5% of employees in unincorporated Shasta County commute via carpool or public transit  | 2035                        |

## CARBON SEQUESTRATION MEASURES:

As trees grow they capture and store atmospheric carbon within their trunks, branches, and roots. By planting new trees, the County can offset a portion of the community's GHG emissions. The following measure describes the County's efforts to expand its urban forest.



### Measure GI-1: Urban Forest

**2020 GHG Reduction Potential:** 30 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 70 MT CO<sub>2</sub>e/yr

The urban forest encompasses all of the trees in the County, from street trees and private landscapes to County parks and natural, open spaces. A healthy urban forest can shade buildings and streets, reducing the urban heat island effect and reducing the need for building cooling. Urban trees also improve water and air quality, increase wildlife habitat, and contribute to neighborhood beautification.

Trees can help the County achieve its GHG reduction goal by reducing building energy-related emissions, as well as through carbon sequestration. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Trees with larger canopies and dense foliage provide more shade than other species. Large, deciduous species are ideal for reducing building energy as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and

roots as they absorb carbon from the air to grow. The California Center for Sustainable Energy created the Advice and Technical Assistance Center (ATAC) for Urban Forestry, which has a full catalog of educational information about tree planting, to assist residents and businesses in planting trees around their buildings.

The County will leverage existing information on the benefits of shade trees, including information provided on the PG&E and ATAC websites, to encourage residents to voluntarily plant shade trees on their property.

| ACTION  | RESPONSIBILITY      |
|---|---------------------|
| <b>Short-Term</b>   |                     |
| <b>A</b> Work with PG&E to advertise the benefits of planting shade trees around buildings and parking lots | Resource Management |
| PROGRESS INDICATORS   | YEAR                |
| 1 400 shade trees are planted.  | 2020                |
| 2 900 shade trees are planted.  | 2035                |

## IMPLEMENTATION AND MONITORING

This section describes how the County will implement the emission reduction measures and actions contained in the CAP. The section contains the following three subsections:

- **Measure Implementation** - Describes how County staff will implement CAP measures and their related actions, and the role of the progress indicators and other guidance provided within the measure tables.
- **Program Evaluation and Evolution** - Discusses the need to evaluate, update, and amend the CAP over time, in order to ensure that the program remains effective and current.
- **Relationship to the California Environmental Quality Act**- Describes the relationship between the CAP and the California Environmental Quality Act (CEQA), and establishes criteria for County staff to use when determining if a proposed project is consistent with the document.

### MEASURE IMPLEMENTATION

Ensuring that the measures translate from policy language into on-the-ground results is critical to the success of the CAP. To facilitate this, each measure contains a table that identifies the specific actions the County will carry out. The table also identifies responsible departments for each action. The second section of each table provides progress indicators that enable County staff, the Board of Supervisors, and the public to track measure implementation and monitor overall CAP progress.

The tables provide both interim (2020) and final (2035) progress indicators where possible. Interim progress indicators are especially important, as they provide mid-course checks to evaluate if a measure is on the right path to achieving its GHG reductions.

Upon adoption of the CAP, the County departments identified will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this action implementation. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships

will need to be established. The County would also need to assess its progress towards measure implementation.

## PROGRAM EVALUATION AND EVOLUTION

The CAP represents the County's best initial attempt to create an organized, communitywide response to the threat of climate change at the time of preparation. Staff will need to evaluate the program's performance over time and be ready to alter or amend the plan if it is not achieving the reduction targets.

### Program Evaluation

Two types of performance evaluation are important: (A) evaluation of the community's overall ability to reduce GHG emissions as a whole and (B) evaluation of the performance of individual CAP measures. Communitywide emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the County versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2008 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction targets. The County will coordinate communitywide inventories in 2015, 2020, 2025, 2030, and 2035, or in association with 5-year General Plan updates, to assess the level of GHG reduction goal attainment.

While communitywide inventories provide information about overall GHG reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures will improve staff and decision makers' ability to manage and implement the CAP. The County can reinforce successful measures and reevaluate or replace under-performing ones. Evaluating measure performance will require data regarding actual community participation rates and measurement of GHG reduction capacity.

The County will coordinate measure evaluation on the same schedule as the communitywide inventories, and summarize the progress towards meeting the GHG reduction goal in a report that describes:

- Achievement of progress indicators
- Participation rates (where applicable)
- Estimated annual GHG reductions in 2020
- Remaining barriers to implementation

Importantly, a progress report on the CAP action items will also be provided to decision-makers on an annual basis. The progress report will include a brief assessment on the progress and implementation of individual CAP measures, including how new projects have incorporated relevant measures. The progress report will allow for gaps and new opportunities to be identified. It also will allow for additional measures to be added to the CAP.

It will be necessary to institute an annual monitoring program that tracks the performance of individual measures. The data collection and processing necessary to establish performance levels would be conducted by the responsible parties identified for each measure (as noted in the measure tables).

### Program Evolution

To remain relevant, the County must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and

State and federal legislation will change. It is also possible that communitywide inventories will indicate that the community is not achieving its adopted target. As part of the evaluations identified above, the County will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

## RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA Guidelines, Section 15183.5 describes the requirements for an emissions reduction plan to be able to provide tiering and streamlining benefits to future development projects. Section 15183.5(b)(1)(D) specifically states that the plan must contain measures, that if implemented on a project-by-project basis, would collectively achieve the plan's established emissions reduction target. This guidance essentially means that each future project seeking to use CEQA tiering will need to demonstrate compliance with the CAP.

### **Project Consistency with the CAP**

The CAP identifies both mandatory and voluntary emission reduction measures that would apply to different types of future proposed projects.

#### ***Mandatory Measures***

For the following mandatory measure, the CAP recommends a change to the County's codes and ordinances that would result in GHG reductions.

- **Measure SW-1 – Lumber Waste Diversion Ordinance**

All projects would be required to comply with this ordinance, making this measure binding and enforceable on new projects, within the meaning established by State CEQA Guidelines Section 15183.5(b)(2). The proposed project would describe how this measure would be integrated into the development in its application materials and environmental documentation.

#### ***Voluntary Measures***

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide emission reductions. These measures will be tracked to ensure participatory rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If not, then additional, more aggressive actions will be necessary to correct any short-fall.





# Chapter 3 - City of Anderson

## PURPOSE

This chapter serves as the Climate Action Plan (CAP) for the City of Anderson. The City has developed this plan in order to contribute to the State's climate protection efforts and to provide California Environmental Quality Act (CEQA) streamlining benefits for new residential and commercial development projects within the community. As stated in State CEQA Guidelines Section 15183.5, for a qualified greenhouse gas (GHG) reduction strategy to provide streamlining benefits for a local jurisdiction, it needs to include the following elements:

- GHG emissions for the jurisdiction need to be quantified through a comprehensive and complete inventory effort. This means identifying and analyzing GHG emissions from specific actions or categories of actions;
- GHG emissions need to be quantified for both existing and anticipated emissions over a specified time period, that result from current and planned activities within the defined jurisdiction area;
- Establish a reduction target for the jurisdiction, below which the contribution to GHG emissions from activities covered by the plan would not be considered cumulatively significant. All assumptions and calculations in making this determination should be transparent. A margin of safety should be built into the plan as well;
- Specify policies, measures, or programs, including performance standards that would collectively achieve the specified emissions reduction level if implemented as a specific project requirement or across a community as an incentive program. An overall reduction plan needs to address existing as well as new development reduction strategies, and should rely primarily on mandatory measures;
- A clearly defined mechanism to monitor the plan's implementation progress toward achieving reduction levels, and to require amendment if the plan is not achieving specified levels.

The content of this chapter is structured to demonstrate compliance with these required elements and to provide the City and community with a useful resource to implement these important actions.

## GREENHOUSE GAS EMISSION INVENTORY AND FORECASTS

The following section provides a summary of the City of Anderson’s communitywide 2008 baseline GHG emissions inventory, the business-as-usual emissions forecasts, and the adjusted business-as-usual forecasts. Detailed information regarding the calculation and assumptions used in preparing the GHG emissions inventory and forecasts is provided in Appendix A.

### GREENHOUSE GAS EMISSIONS INVENTORY

The 2008 GHG emissions inventory serves as the foundation of the City’s CAP. Using data collected from City departments, utilities, and other relevant agencies and locally-specific emissions factors, the inventory provides an accurate assessment of the sources of GHG gas emissions generated within or as a direct result of the community in the baseline year. This data allows the City to identify appropriate GHG reduction targets and strategies.

To ensure a comprehensive and complete GHG inventory, the City developed a *Full Inventory* that contains emissions from all sectors including building energy (electricity and natural gas), water (including wastewater treatment emissions), waste, transportation, off-road vehicles, and recreation. There is no agriculture, forestry, and stationary source emissions generated in the city, so the total and jurisdictional inventory are identical.

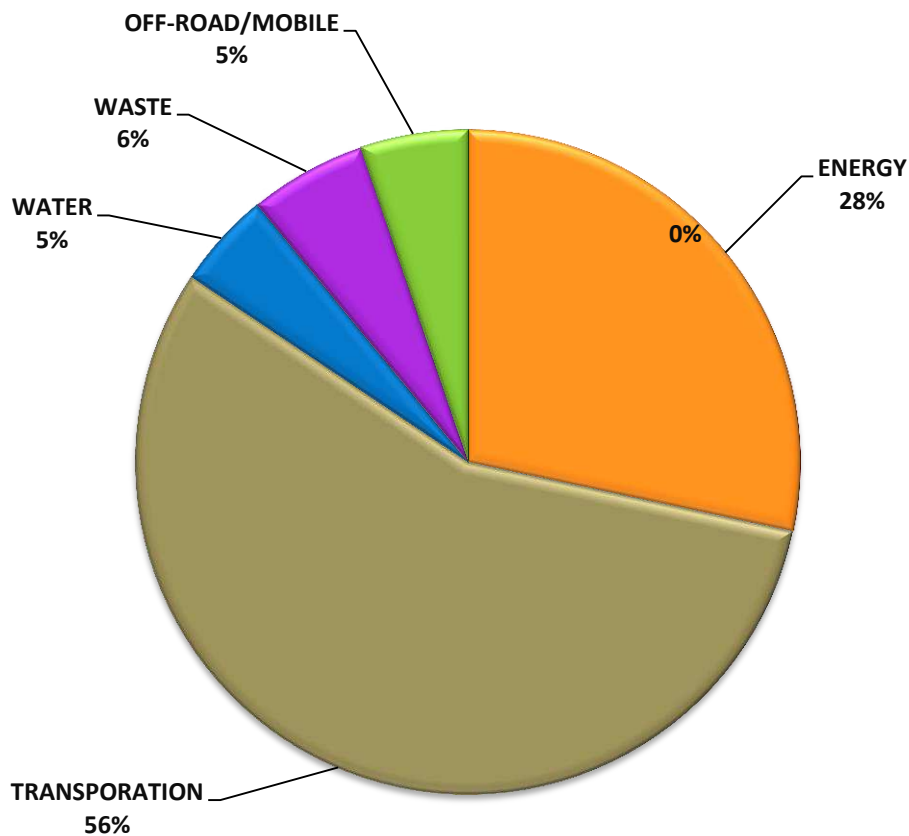
### Total and Jurisdictional Inventory

In 2008, the community’s total baseline emissions included 88,625 metric tons of carbon dioxide equivalent emissions (MT CO<sub>2</sub>e). As shown in Figure 3.1 and Table 3.1, transportation-related emissions generated the largest portion of emissions at approximately 49,679 MT CO<sub>2</sub>e (56% of the total emissions), followed by energy-related emissions at 25,113 MT CO<sub>2</sub>e (28% of the total emissions). The water, solid waste, and off-road/recreation sectors comprise the remaining 16% of the emissions inventory. In the City of Anderson, the total inventory and jurisdictional inventories are the same because there are no non-jurisdictional emissions.

**Table 3.1 – Greenhouse Gas Emissions Inventory and Business-as-Usual Forecasts: 2008, 2020, 2035, and 2050**

| Sector                     | 2008<br>(MT CO <sub>2</sub> e/yr) | 2020<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 | 2035<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 | 2050<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 |
|----------------------------|-----------------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|
| Energy                     | 25,113                            | 27,526                            | 10%                         | 32,669                            | 30%                         | 38,601                            | 54%                         |
| Transportation             | 49,679                            | 56,520                            | 14%                         | 73,953                            | 49%                         | 93,560                            | 88%                         |
| Solid Waste                | 5,057                             | 5,414                             | 7%                          | 5,911                             | 17%                         | 6,632                             | 31%                         |
| Water                      | 4,156                             | 4,449                             | 7%                          | 4,857                             | 17%                         | 5,450                             | 31%                         |
| Off-Road and<br>Recreation | 4,618                             | 4,945                             | 7%                          | 5,400                             | 17%                         | 6,058                             | 31%                         |
| <b>TOTAL<br/>INVENTORY</b> | <b>88,625</b>                     | <b>98,854</b>                     | <b>11.5%</b>                | <b>122,790</b>                    | <b>38.5%</b>                | <b>150,302</b>                    | <b>69.6%</b>                |



**Figure 3.1 – 2008 Jurisdictional Greenhouse Gas Emissions Inventory by Sector**

### BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Developing realistic GHG emission forecasts is a critical step in preparing a CAP. Emission forecasts estimate future emissions levels and provide insight regarding the scale of reductions necessary to achieve an emissions target. The City has prepared GHG forecasts area for 2020, 2035, and 2050 horizon years.

The City's emissions are forecasted to be 98,854 MT CO<sub>2</sub>e in 2020, 122,790 MT CO<sub>2</sub>e in 2035, and 150,302 MT CO<sub>2</sub>e in 2050, representing growth of 12%, 39%, and 70%, respectively, from the 2008 baseline emissions. Table 3.1 shows that while emissions are forecasted to increase in all sectors, transportation-related emissions are anticipated to increase at a greater rate than other sectors.

The forecasts were established using sector-specific growth factors (e.g., energy demand forecasts) or the City's population and employment growth projections. When based on population and employment growth projections, the GHG forecasts assume that baseline year activity intensity (e.g., waste generation per capita) will continue into the future. The business-as-usual GHG forecasts do not include emission reductions associated with State GHG reduction programs or implementation of the local actions described in this CAP.

The forecasts were developed for planning purposes, and represent the best-available estimates. Given the complexity of each emissions sector and the unpredictable nature of market conditions, human behavior and demographics, they will need to be updated in the future as data becomes available. The City will reevaluate the forecasts throughout the CAP implementation process.

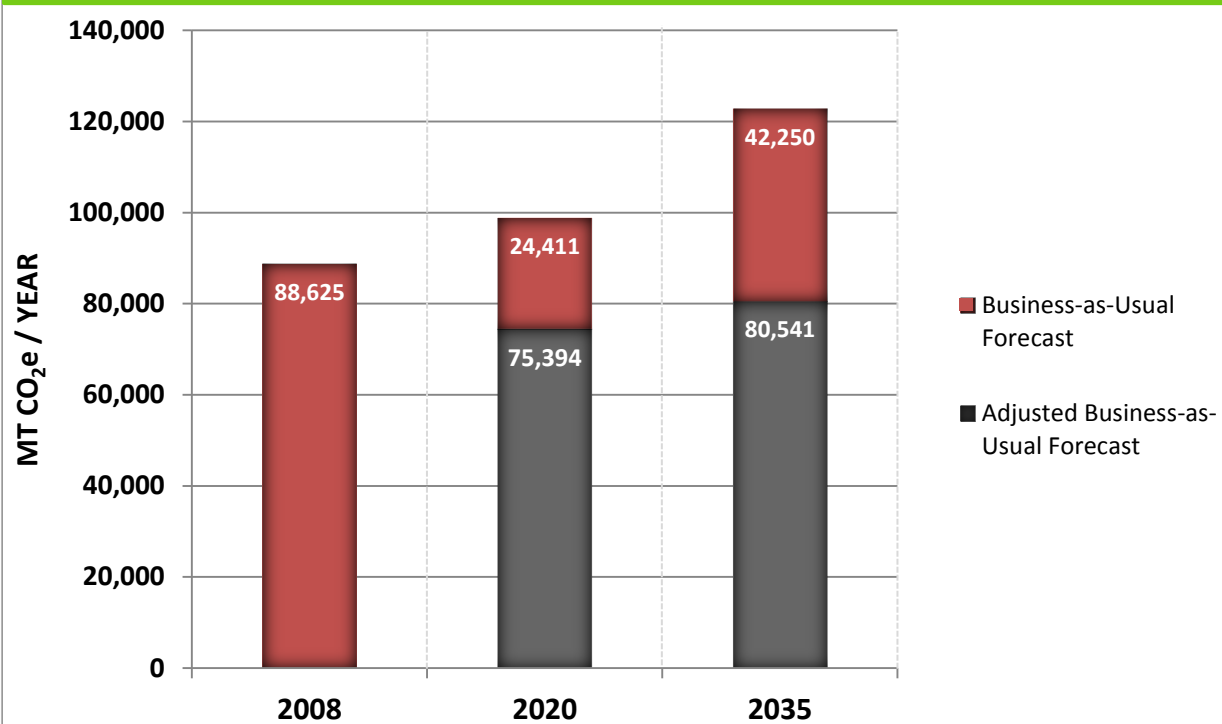
### ADJUSTED BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Table 3.2 describes the emission reductions anticipated to occur within the community through implementation of State and federal policies and regulations. The largest anticipated reductions are from State and federal fuel efficiency improvements to passenger vehicles and light-duty trucks. As residents and businesses replace older vehicles with newer ones, people will consume less fuel and generate fewer emissions per vehicle mile traveled. California's low carbon fuel standard will also reduce transportation-related emissions in the community by requiring a transition away from fossil fuels (i.e., gasoline and diesel) toward lower-carbon bio-fuels (e.g., ethanol). California law also requires all utilities to obtain 33% of their electricity from renewable energy sources by 2020. In 2008, about 12% of the Pacific Gas and Electric's electricity portfolio was generated from renewable sources. This increase in renewable electricity will reduce the community energy-related emissions. The medium- and heavy-duty vehicle efficiency improvements program and California Energy Code (Title-24) requirements for new construction will create smaller, but still important, communitywide emission reductions.

State and federal actions that reduce communitywide emissions in City of Anderson will make it easier for the community to achieve 2020 and 2035 emission reduction goals. As shown in Table 3.2 and Figure 3.2, with implementation of State and federal actions, communitywide emissions would be 75,394 MT CO<sub>2</sub>e/yr in 2020 and 80,541 MT CO<sub>2</sub>e/year in 2035.

**Table 3.2 – Emission Reductions from State and Federal Actions  
2020 and 2035**

| State or Federal Action  | 2020 Reduction<br>(MT CO <sub>2</sub> e/year) | 2035 Reduction<br>(MT CO <sub>2</sub> e/year) |
|--|---|---|
| Passenger vehicle and light-duty truck fuel efficiency standards | 11,921  | 27,054  |
| Low Carbon fuel standard   | 5,459   | 6,648   |
| Non-Pavley Passenger Vehicle Efficiency Programs                 | 1,427   | 1,848   |
| Medium- and heavy-duty vehicle efficiency improvement program    | 346   | 462   |
| 2008 and 2013 California Title-24 standards                      | 506   | 606   |
| Renewable portfolio standard (33% by 2020)                       | 4,752   | 5,632   |
| <b>Total</b>   | <b>24,411</b>                                 | <b>42,250</b>                                 |

**FIGURE 3.2 - BUSINESS-AS-USUAL & ADJUSTED BUSINESS-AS-USUAL EMISSIONS FORECASTS**

## GREENHOUSE GAS EMISSION REDUCTION TARGETS

The City has selected emission reduction targets that are both ambitious and practical. The targets will allow the City to contribute to State climate protection efforts and are purposely set at levels that are likely to provide CEQA streamlining benefits to new development projects in the community. City of Anderson's GHG reduction targets are as follows:

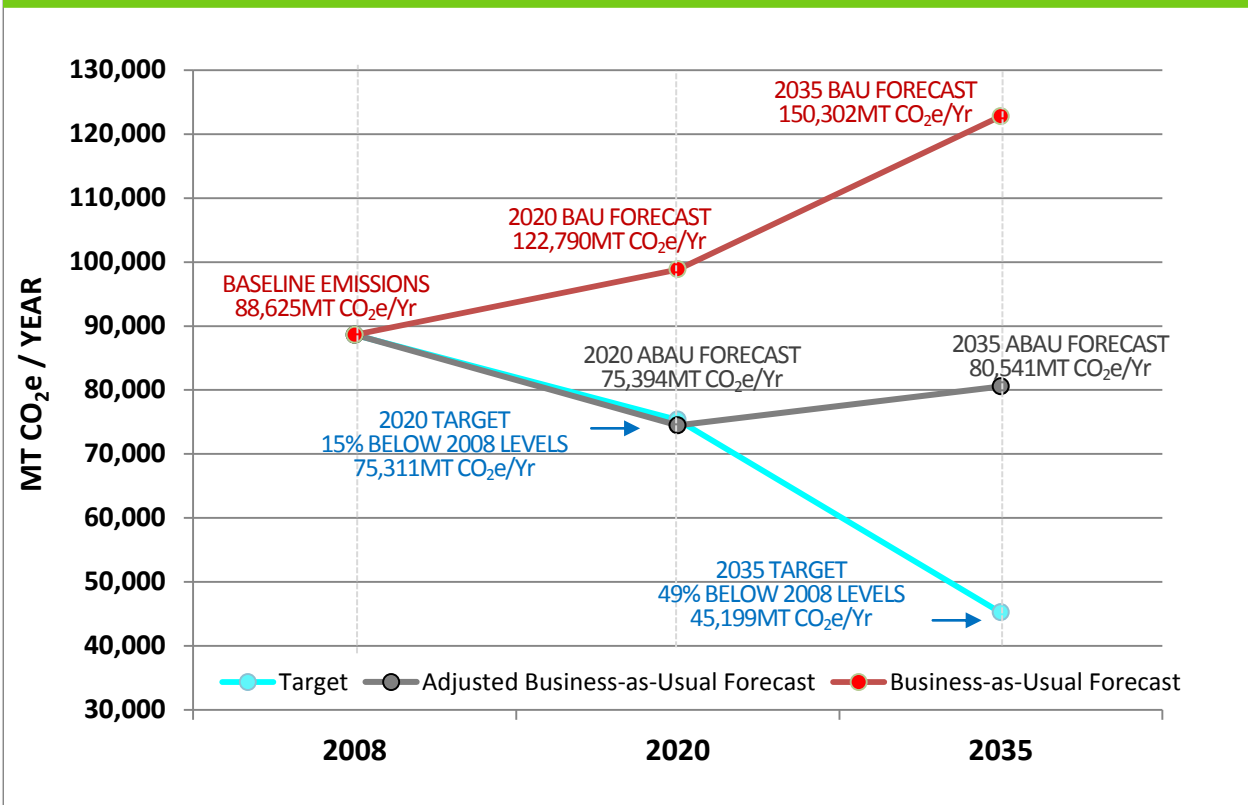
- Reduce community emissions to 15% below 2008 levels by 2020 (75,331 MT CO<sub>2</sub>e/yr)
- Reduce community emissions to 49% below 2008 levels by 2035 (45,198 MT CO<sub>2</sub>e/yr)
- Reduce community emissions to 83% below 2008 levels by 2050 (15,066 MT CO<sub>2</sub>e/yr)

The California Global Solutions Warming Act (AB 32) requires the State to reduce statewide GHG emissions to 1990 levels by 2020. The City selected its 2020 target in order to contribute the community's fair share to this near-term effort. This target aligns with direction provided by the California Air Resources Board. Executive Order S-03-05 directs the State to reduce emissions to 80% below 1990 levels by 2050. In order to contribute to this long-term effort, the City strives to achieve an equivalent goal of reducing community emissions to 83% below 2008 levels in the same time period. To be on a path toward that goal, the City will need to reduce emissions to a level 49% below 2008 by 2035. Calculations showing the logic of this interim goal can be examined in Appendix C.

This CAP describes measures that can achieve the 2020 reduction target and work toward the 2035 target. While the City supports the goal of Executive Order S-03-05, it recognizes that estimating 2050 emission levels and reduction potentials are highly speculative. For this reason, the City has chosen not

to focus on the 2050 reduction target at this time. The City will regularly re-evaluate its long-term GHG reduction efforts to reflect future conditions and adjust emission reduction measures accordingly.

**FIGURE 3.3 - GREENHOUSE GAS REDUCTION TARGETS 2020 & 2035**



## GREENHOUSE GAS EMISSION REDUCTION MEASURES

To meet its adopted emissions reduction targets, the City will implement policies, programs, and other projects related to energy, waste, water, transportation, and carbon sequestration. This section provides a summary of the CAP's overall emissions reduction potential and describes the measures that the City will use to implement the local actions.

### SUMMARY OF REDUCTIONS

Table 3.3 describes the emissions reduction potential of the City's adopted CAP measures. In 2020, local actions are anticipated to reduce approximately 5,491 MT CO<sub>2</sub>e/yr. The waste-related measures are expected to provide the largest portion, 63%, of the local reductions. The energy-related measures will provide around 24%, followed by transportation (12%), and carbon sequestration (0.9%). Table 3.4 and Figure 3.3 illustrate that together the local and state actions are expected to reduce communitywide emissions to approximately 23.3% below 2008 baseline emissions levels, surpassing the adopted 2020 target (15% below 2008 levels) by 6,379 MT CO<sub>2</sub>e/yr. This estimated level of reduction conforms to the CEQA requirements for a qualified GHG reduction strategy and can be expected to provide streamlining benefits for compliant projects constructed within the jurisdiction prior to 2020.

In 2035, local actions are anticipated to reduce approximately 9,000 MT CO<sub>2</sub>e/yr. The source of reductions is very similar to those in 2020, with waste and energy-related measures contributing the

two highest proportions. Local and state actions are expected to reduce communitywide emissions to approximately 19.3% below 2008 baseline emission levels, a level that falls short of the City's adopted 2035 target (49% below 2008 levels). The City anticipates that new technologies and State or federal policies will be developed and will assist the community to achieve this longer-term goal.

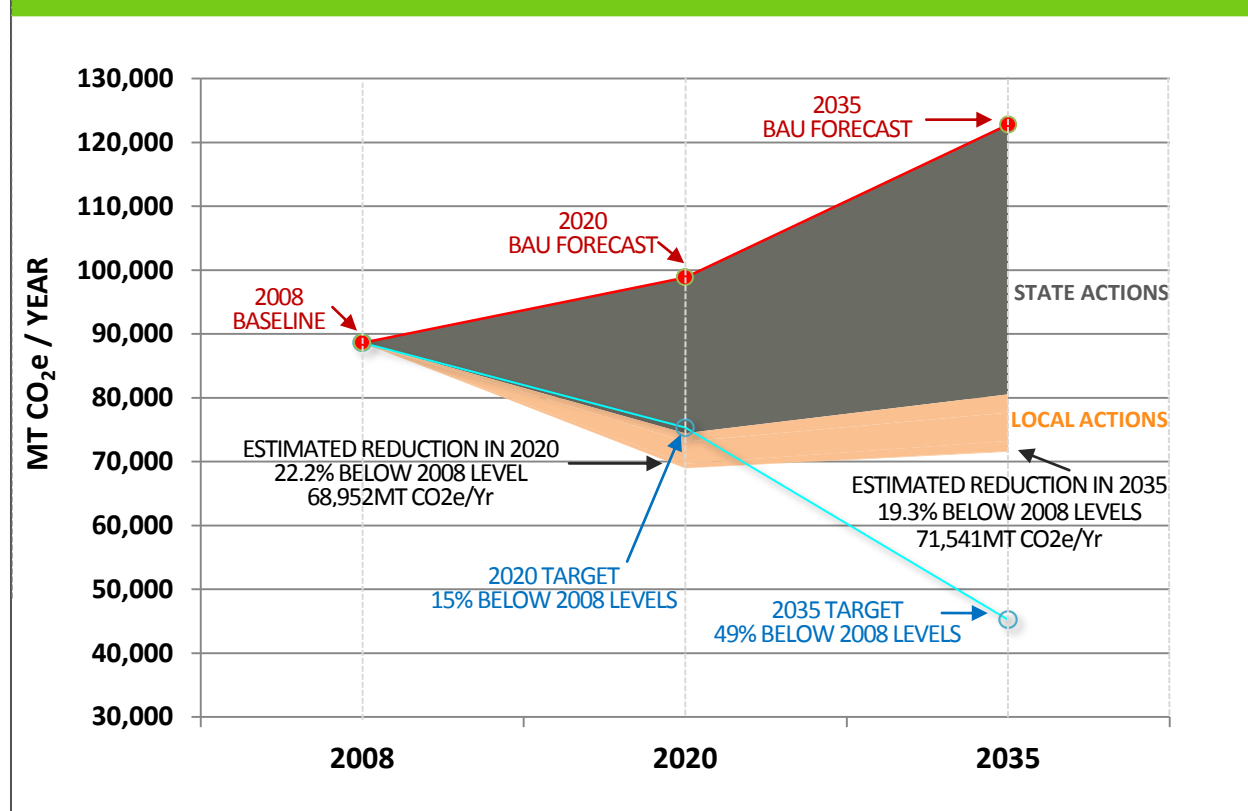
**Table 3.3 – Quantified Greenhouse Gas Reductions**

| Sectors and Measures                 |                                     | 2020<br>(MT CO <sub>2</sub> e/yr) | 2035<br>(MT CO <sub>2</sub> e/yr) |
|--------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|
| <b>Building Energy</b>               |                                     |                                   |                                   |
| BE-1                                 | Existing Buildings                  | 127                               | 285                               |
| BE-2                                 | New Construction                    | 0                                 | 0                                 |
| BE-3                                 | Commercial Lighting                 | 183                               | 496                               |
| BE-4                                 | Efficient Appliances                | 229                               | 566                               |
| BE-5                                 | Smart Grid Integration              | 711                               | 1,364                             |
| BE-6                                 | Solar Water Heaters                 | 56                                | 149                               |
| <b>Subtotal</b>                      |                                     | <b>1,306</b>                      | <b>2,861</b>                      |
|                                      |                                     |                                   |                                   |
| SW-1                                 | Enhanced Organic Waste Diversion    | 159                               | 406                               |
| SW-2                                 | Methane Recovery                    | 3,319                             | 4,029                             |
| <b>Subtotal</b>                      |                                     | <b>3,478</b>                      | <b>4,435</b>                      |
|                                      |                                     |                                   |                                   |
| T-1                                  | Mixed Use Development               | 263                               | 1,014                             |
| T-2                                  | Bicycle Lane Expansion              | 23                                | 95                                |
| T-3                                  | Pedestrian Environment Enhancements | 352                               | 460                               |
| T-4                                  | Commute Trip Reduction              | 20                                | 24                                |
| <b>Subtotal</b>                      |                                     | <b>657</b>                        | <b>1,594</b>                      |
| <b>Carbon Sequestration</b>          |                                     |                                   |                                   |
| GI-1                                 | Urban Forest                        | 50                                | 110                               |
| <b>Subtotal</b>                      |                                     | <b>50</b>                         | <b>110</b>                        |
| <b>TOTAL LOCAL ACTION REDUCTIONS</b> |                                     | <b>5,491</b>                      | <b>9,000</b>                      |

**Table 3.4 - Reduction Potential of City's CAP Measures**

|  | 2008     | 2020                          |              |                           | 2035                          |                      |                           |
|--|----------|-------------------------------|--------------|---------------------------|-------------------------------|----------------------|---------------------------|
|  | Baseline | BAU                           | ABAU         | ABAU + Local CAP Measures | BAU                           | ABAU                 | ABAU + Local CAP Measures |
| <b>GHG Emissions (MT CO<sub>2</sub>e/Yr)</b> | 88,625   | 98,854                        | 74,443       | 68,952                    | 122,790                       | 80,541               | 71,541                    |
| <b>Change from Baseline</b>                  | NA       | 11.5%                         | -16.0%       | -22.2%                    | 38.6%                         | -9.1%                | -19.3%                    |
| <b>CAP GHG Reduction Targets</b>             | NA       | Target = 15% below 2008 level | Meets Target | Meets Target              | Target = 49% below 2008 level | Does Not Meet Target | Does Not Meet Target      |

Figure 3.4 demonstrates the relative contribution of State and the City's local actions. While the State actions alone achieve the 2020 target, the local actions provide additional reductions and demonstrate the City's contribution to the State's climate protection efforts. In 2035, State and local reductions increase in scale, but do not provide enough reductions to counteract the community's forecasted emissions growth or the more aggressive 2035 target.

**FIGURE 3.4: EMISSIONS REDUCTION POTENTIAL OF STATE AND LOCAL ACTIONS**

## REDUCTION MEASURES

The CAP measures define the programs, policies, and projects that the City will undertake to accomplish its emission reduction objectives. Within this section, the measures are organized into four categories including: energy, waste, transportation, and carbon sequestration. Each category begins with an introduction followed by the pages that describe the component measures.

### Measure Structure

To aid the reader and to facilitate implementation of the CAP, each measure contains the following information:

- **Emission Reductions** - Reduction potential values are provided after each measure title, and identify the estimated annual emission reductions anticipated in 2020 and 2035 in MT CO<sub>2</sub>e/yr. All measures have a quantifiable GHG reduction potential.
- **Description** - Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide guidance that will be used in program implementation or highlight the City's actions to date that relate to a particular measure.
- **Actions and Progress Indicators** - Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the City will take to implement the measure. The table also identifies responsible departments. Progress indicators enable staff, the City Council, and the public to track implementation and monitor overall CAP progress. Specific progress indicators are provided for both 2020 and 2035.

### ENERGY MEASURES:

The use of electricity and natural gas within residential, commercial, and industrial buildings generated over 28% of Anderson's communitywide GHG emissions in 2008. The energy measures described on the following pages recommend ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase the use of renewable energy.



### Measure BE-1: Energy Efficiency Retrofits

**2020 GHG Reduction Potential: 127 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 285 MT CO<sub>2</sub>e/yr**

Sixty three percent of owner-occupied homes and forty nine percent of renter-occupied units in Anderson were built before the State of California adopted the Title 24 energy efficiency requirements in 1980. Energy efficiency retrofits help residents reduce their utility bills and the community's building-related emissions. Energy audits can identify inefficient heating and cooling systems and gaps in the building's envelope through which heat escape or enter. Audits can also help homeowners and building owners prioritize cost-effective retrofit investments to maximize their financial returns.

The City will partner with PG&E to implement programs that promote energy efficiency retrofits in existing residential buildings. PG&E currently offers a variety of rebates for installing energy-efficient features, including:

- cool roofs,
- attic and wall insulation,
- cooling and heating equipment, and
- swimming pool pumps.

PG&E also offers rebates on whole-house packages for homeowners that wish to address energy efficiency holistically.

The Energy Upgrade California website ([www.energyupgradeca.org](http://www.energyupgradeca.org)) is another resource to identify rebates and incentive programs throughout the state. There are currently over 50 programs available to Anderson residents, which are funded by utility companies and state agencies. Incentives and rebates are available to help home and business owners improve efficiency in the following areas:

- air and duct sealing and attic, wall, and hot water pipe insulation;
- water-efficient fixtures (e.g., low-flow shower heads);
- HVAC upgrades (e.g., air conditioners, whole house fans, ducted evaporative cooling systems, ceiling fans);
- cool roofs;
- hot water heaters/blankets;
- indoor lighting; and
- ENERGY STAR appliances (e.g., dishwashers, refrigerators, freezers).

The City currently works with the California Department of Housing to provide CDBG grant funding to homeowners that qualify for grant funding to improve their home energy efficiency. The City will develop a comprehensive community education outreach campaign with use of newspaper advertisements, website promotion and community event giveaways, based on funding availability. The City will also encourage use of other available resources such as California Flex Your Power, the Department of Energy's (DOE) Weatherization Assistance Program, and PG&E's SmartEnergy Analyzer™ program, all of which link residential property owners to educational and financial resources. The City will emphasize voluntary participation in these energy efficiency retrofit programs, in lieu of mandatory requirements.

| ACTION              |   | RESPONSIBILITY      |
|---------------------|---|---------------------|
| <b>Short-Term</b>   |   |                     |
| <b>A</b>            | Partner with PG&E to promote and improve utility incentives for energy conservation programs for older homes and renovations.   | Building Department |
| <b>B</b>            | Facilitate the use of energy efficient demonstration homes as an education/promotion tool.  | Building Department |
| <b>Medium-Term</b>  |   |                     |
| <b>C</b>            | Consider development of a Property Assessed Clean Energy (PACE) program.  | Planning Department |
| PROGRESS INDICATORS |   | YEAR                |
| <b>1</b>            | 10% of existing residential units and 10% of existing non-residential square feet perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, AC refrigerant recharge)         | 2020                |
| <b>2</b>            | 22.5% of existing residential units and 22.5% of existing non-residential square feet perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, and AC refrigerant recharge) | 2035                |





## Measure BE-2: New Construction

**2020 GHG Reduction Potential:** Included in Title-24 State Reductions

**2035 GHG Reduction Potential:** Included in Title-24 State Reductions

The City will partner with PG&E to promote building energy efficiency through utility incentives and streamlined permitting. Energy efficient building design and construction can help reduce heating needs in the winter and cooling needs in the summer.

The 2010 CalGreen Building Code (CalGreen) sets guidance for higher building performance standards. CalGreen offers two voluntary compliance pathways to achieve 15% and 30% energy efficiency above the State's 2008 Title 24 Energy Code efficiency requirements. Contingent upon funding availability, the City will offer priority permitting to new residential projects that demonstrate 15% higher energy efficiency than Title 24 requirements. These efforts will serve to increase energy efficiency of new residential buildings and would help to lower homeowners utility bills.

Additional energy savings are anticipated to be created through the 2013 update of the State's Title 24 standards. All new construction developed between 2010 and 2015 has been, or will be, required to meet the 2008 Title-24 requirements. All new construction developed between 2015 and 2020 will be required to comply with the updated 2013 Title 24 requirements that the California Energy Commission estimates will be 20-25% more energy efficient than the 2008 standards. The City anticipates that more than 50% of all new construction in the City will be subject to the 2013 Title 24 standards. The City's CAP includes reductions associated with the 2008 and 2013 Title 24 standards with the statewide reductions (see appendix B for details). Further increases in Title 24 standards are anticipated after 2017 but are too speculative at this point in time to quantify.

Because the State develops the Title 24 standards for each code period with the goal of balancing energy efficiency and cost-effectiveness, the City believes it is not prudent to require efficiency at a level higher than the State's standard. The City will not adopt an efficiency standard more stringent than the State's code.

| ACTION              |  | RESPONSIBILITY               |
|---------------------|--|------------------------------|
| <b>Short-Term</b>   |  |                              |
| <b>A</b>            | Partner with PG&E to promote and provide utility incentives for energy efficiency programs in new construction.                        | PG&E;<br>Building Department |
| <b>B</b>            | Develop a priority permitting program for new construction projects that demonstrate 15% higher efficiency than Title 24 requirements. | PG&E;<br>Building Department |
| PROGRESS INDICATORS |  | YEAR                         |
| <b>1</b>            | 50% of new construction to achieve 25% reduction in energy use above 2008 Title 24 energy efficiency standards.                        | 2020                         |
| <b>2</b>            | 80% of new construction to achieve 25% reduction in energy use above 2008 Title 24 energy efficiency standards.                        | 2035                         |



## Measure BE-3: Commercial Lighting

**2020 GHG Reduction Potential: 183 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 496 MT CO<sub>2</sub>e/yr**

There is approximately 870,000 square feet of non-residential building space in Anderson. Conventional commercial lighting used to illuminate these buildings, including T12 fluorescent bulbs, consumes more energy than new T8 or T5 lights, light-emitting diodes (LED), and other efficient lighting technologies. Retrofitting existing commercial interior lighting is a relatively easy upgrade to make, and rebate programs are available to reduce the already short simple payback period.

PG&E currently provides a commercial lighting retrofit program to all businesses, to replace old inefficient T-12 fixtures with energy-efficient fluorescent lighting. The lighting upgrade program includes rebates to upgrade from T12 to T8 lamp and electronic ballast, de-lamp T12s, and upgrade T12 fixtures to more efficient interior fixtures.

The City will work with non-residential developers during the building permit phase to ensure that applicable rebate programs are used to their greatest effect by community's businesses and institutional building owners. The City will also provide targeted outreach and technical assistance to owners/managers of large (i.e., > 50,000 sq ft), non-residential buildings to encourage participation in PG&E's lighting upgrade program. The City's outreach will include a description of the short payback period associated with lighting upgrade improvements.

In the mid-term, the City will consider expansion of outreach program to focus on parking lot and public area lighting.

| ACTION              |   | RESPONSIBILITY    |
|---------------------|---|-------------------|
| <b>Short-Term</b>   |   |                   |
| <b>A</b>            | Partner with PG&E to promote and provide utility incentives for commercial interior lighting retrofits.     | PG&E;<br>Planning |
| <b>B</b>            | Discuss applicable rebates and incentive programs with building developers during the building permit phase | Building          |
| <b>C</b>            | Provided targeted outreach to building owners/managers of large non-residential buildings                   | Planning          |
| <b>Medium-Term</b>  |   |                   |
| <b>D</b>            | Develop a parking lot and public area lighting-specific outreach program.                                   | Planning          |
| PROGRESS INDICATORS |   | YEAR              |
| <b>1</b>            | 40% of businesses improve interior and exterior lighting efficiency by 40%.                                 | 2020              |
| <b>2</b>            | 90% of businesses improve interior and exterior lighting efficiency by 40%.                                 | 2035              |



## Measure BE-4: Efficient Appliances

**2020 GHG Reduction Potential: 229 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 566 MT CO<sub>2</sub>e/yr**

As building shells and systems become increasingly efficient, addressing energy consumption from appliances and electronics will become more important in reducing building energy use and residents' utility bills. This measure is designed to encourage voluntary community participation to upgrade home appliances to Energy Star or other energy efficient models. Modern technology has contributed to the development of high-quality, energy efficient appliances. The Energy Star rating is an internationally recognized standard for energy efficient consumer products. According to the EPA, devices that have an Energy Star certification, such as office equipment, home appliances, and lighting products, generally use 20 to 30 percent less energy than required by federal standards.

The City will partner with PG&E and other organizations to promote existing financial incentives and rebates for energy-efficient appliance upgrades and replacements in both new and existing residential units. Successful implementation of this measure requires a broad public outreach campaign to reach all segments of the community. The City will identify community events at which it can staff an informational table to advertise energy-efficiency rebates and incentives, including farmers' markets, Burney Basin Days, the Strawberry festival, and the Shasta County Fair. The City encourage PG&E to include informational inserts in utility bills that advertise PG&E's existing rebate programs and the simple cost payback associated with replacing inefficient appliances. Targeted outreach should also be provided to the building community at the building permit phase and to homebuyers and renters through a partnership with local realtors and property managers.

| ACTION              |   | RESPONSIBILITY |
|---------------------|---|----------------|
| <b>Short-Term</b>   |   |                |
| <b>A</b>            | Collaborate with PG&E to promote existing financial incentives programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances  | PG&E; Planning |
| <b>B</b>            | Advertise energy-efficient appliance rebates at community events  | Planning       |
| PROGRESS INDICATORS |   | YEAR           |
| <b>1</b>            | 40% of existing homes will replace old model refrigerators, dishwashers, and 80% of existing homes will replace old clothes washers with new Energy Star models.<br>70% of new homes will install Energy Star refrigerators, dishwashers and clothes washers. | 2020           |
| <b>2</b>            | 90% of existing homes will replace old model refrigerators, dishwashers, and clothes washers with new Energy Star models.<br>90% of new homes will install Energy Star refrigerators, dishwashers and clothes washers.  | 2035           |



## Measure BE-5: Smart Grid Integration

**2020 GHG Reduction Potential: 711 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,364 MT CO<sub>2</sub>e/yr**

The 'Smart Grid' is an emerging energy management system which uses information technology to significantly improve how electricity is managed and controlled. Smart meters, which use a technology that enables users to take full advantage of the smart grid, will eventually provide utility customers with access to detailed energy use and cost information, new dynamic pricing programs based on peak-energy demand, and the ability to program home appliances and devices to respond to energy use preferences based on cost, comfort, and convenience.

The first step in saving energy from the smart grid is to install smart meters, which allow customers to track their home or businesses energy use throughout the day. In 2011, PG&E began installing smart meters in homes and businesses throughout Shasta County, including Anderson. The value of the smart grid does not end at the meter, however; its full value is realized when it extends into technologies used in homes and businesses. For example, smart appliances can be programmed to operate during off-peak hours when electricity prices are cheaper.

The City will encourage voluntary adoption of smart grid technology in new and existing construction, promoting the use of smart appliances in homes and businesses. The City will develop an outreach campaign highlighting the benefits of smart grid integration that can occur following smart meter installation. The outreach campaign should describe how energy management systems work inside a building, including internet-based displays (e.g., smart phone applications) that show how much energy is being used and smart appliances that can defer discretionary electricity use to off-peak hours.

| ACTION              |   | RESPONSIBILITY |
|---------------------|---|----------------|
| <b>Medium-Term</b>  |   |                |
| <b>A</b>            | Develop an outreach program that informs property owners and businesses about smart grid and smart appliance technologies, as well as energy conservation opportunities using smart meter technology. | Planning       |
| PROGRESS INDICATORS |   | YEAR           |
| <b>1</b>            | 20% of existing and 50% of new residential units to use Smart Grid technology.  | 2020           |
| <b>2</b>            | 45% of existing and 90% of new residential units to use Smart Grid technology.  | 2035           |



## Measure BE-6: Solar Water Heaters

**2020 GHG Reduction Potential: 56 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 149 MT CO<sub>2</sub>e/yr**

Anderson's location result in a relatively high solar insolation rating (comparable to southern cities, such as Orlando, FL and New Orleans, LA), which makes it an excellent candidate for effective adoption of solar technologies. Solar hot water systems are a simple and reliable method for harnessing the sun's energy to provide for hot water needs.

Solar hot water systems can be a cost-effective replacement for inefficient water heaters. According to the California Solar Initiative (CSI), solar hot water systems can lower energy bills by meeting 50 to 80 percent of hot water needs. Though the high capital cost of solar water heater upgrades can pose a financial burden to homeowners, there are a range of financing and rebate options to offset these initial investment costs. Through the CSI-Thermal Program, single-family homeowners are eligible for SWH rebates of up to \$1,875. Non-residential customers who install certified SWH systems can qualify for incentives of up to \$500,000 to offset capital costs. Incentive levels will decline in four stages as the solar thermal market grows. Actual incentive payments will be determined by the thermal output of the system. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470), created a 10-year program aimed at installing solar water heaters in homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000-\$6,000.

The City will partner with PG&E to identify rebate options for residents to voluntarily replace inefficient water heating systems with solar water heaters. During retrofit the City will encourage customers to switch to electric backup water heating system, which will result in additional GHG reductions when compared to natural gas heaters. There are a number of financing options that may be used to reduce upfront costs, such as federal tax incentives through the Energy Policy Act of 2005, and financial incentives through AB 1470. The City will work the California Solar Initiative to create outreach programs to provide information about the benefits of solar hot water heaters to encourage participation. The City will create a streamline permit process for solar water heater installation.

| ACTION              |  | RESPONSIBILITY      |
|---------------------|--|---------------------|
| <b>Short-Term</b>   |  |                     |
| <b>A</b>            | Work with PG&E and California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential and commercial buildings. | Planning            |
| <b>B</b>            | Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation.  | Building Department |
| <b>C</b>            | Encourage the use of California Solar Initiative, US EPA, PG&E, and other rebates for solar hot water heaters  | Planning            |
| PROGRESS INDICATORS |  | YEAR                |
| <b>1</b>            | 2% of residences and businesses install a solar hot water system.  | 2020                |
| <b>2</b>            | 4.5% of residences and businesses install a solar hot water system.  | 2035                |

## WASTE MEASURES:

The decomposition of the community's solid waste in landfills generated approximately 6% of Anderson's communitywide GHG emissions in 2008. The waste-related measures described on the following pages recommend ways to increase diversion of organic lumber wastes and describe the County's implementation of enhanced landfill methane capture systems, which will also benefit the City's share of methane recovery.



## Measure SW-1: Enhanced Organic Waste Diversion

**2020 GHG Reduction Potential: 159 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 406 MT CO<sub>2</sub>e/yr**

Anderson promotes waste diversion from landfills by providing separate waste bins for trash, recyclable items and green yard waste. In the short-term, the City will augment existing waste diversion programs, conduct a variety of outreach programs to increase participation in waste reduction, recycling and composting programs, and work with waste hauling operators to ensure achievement of this goal. Specifically the City will develop an outreach program to encourage enhanced yard waste collection and construction and demolition waste diversion. The City will enforce the State requirement that builders divert 50% of all construction and demolition related waste.

As mid-term actions the City will explore recycling franchise agreements with Pay-as-You-Throw (PYT) waste disposal programs, participate in EPA's WasteWise Communities program that provides technical assistance to promote cost savings and efficiency with waste prevention, recycling, and purchasing recycled content products and explore implementing a commercial recycling program designed to divert commercial solid waste by businesses.

| ACTION              |   | RESPONSIBILITY                         |
|---------------------|---|--|
| <b>Short-Term</b>   |   |  |
| <b>A</b>            | Enhance implementation of existing recycling and composting programs through education and outreach, including specific enhanced yard waste and construction and demolition waste diversion programs. | Public Works                           |
| <b>B</b>            | Incorporate waste reduction measures into future solid waste and recycling franchise agreements.  | Public Works                           |
| <b>Medium-Term</b>  |   |  |
| <b>C</b>            | Explore opportunity to incorporate waste reduction measures into future solid waste and recycling franchise agreements through a PYT Waste Disposal Program.  | Air District;<br>Shasta County Finance |
| <b>D</b>            | Participate in EPA's WasteWise Communities, which offers technical assistance to promote cost savings and efficiency with waste prevention, recycling, and purchase of recycled products.             | Public Works                           |
| <b>E</b>            | Explore implementation of a commercial recycling program to divert commercial solid waste.  | Public Works                           |
| PROGRESS INDICATORS |   | YEAR                                   |
| <b>1</b>            | Community increases diversion of yard and construction and demolition wastes by 50%.  | 2020                                   |
| <b>2</b>            | Community increases diversion of yard and construction and demolition wastes by 50%.  | 2030                                   |



## Measure SW-2: Methane Recovery

**2020 GHG Reduction Potential: 3,319 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 4,029 MT CO<sub>2</sub>e/yr**

The Air Resources Board approved a regulation to reduce methane emissions from municipal solid waste landfills as an early implementing action of the California Global Warming Solutions Act (Assembly Bill 32). Per the regulation, methane capture facilities have been required at all municipal solid waste landfills since June 2010. Two landfills are used in Shasta County to dispose of waste from the community: the West Central Landfill and the Anderson Landfill. The West Central Landfill is currently an uncontrolled municipal solid waste landfill, meaning there is no methane capture infrastructure in place. However, the County is in the process of constructing a gas control system that would capture landfill-generated methane and direct it to a flare where it would be burned off, dramatically reducing the global warming potential of the gas. In the future, this system may be upgraded to a landfill gas-to-energy system under which an operator could construct a power plant to capture the landfill methane and burn it to generate electricity. The Anderson Landfill currently has a methane capture system in place with no plans for system upgrades.

The County's action effectively reduces the City's waste-related emissions. The City will consult with County staff to ensure methane capture is achieved.

| ACTION              |  | RESPONSIBILITY |
|---------------------|--|----------------|
| <b>Short-Term</b>   |  |                |
| <b>A</b>            | Consult with County staff to verify the installed methane capture system at the West central Landfill achieves the estimated 75% control efficiency. | Public Works   |
| PROGRESS INDICATORS |  | YEAR           |
| <b>1</b>            | West Central Landfill achieves a methane control efficiency of 75%.  | 2020           |
| <b>2</b>            | West Central Landfill maintains a methane control efficiency of 75%.   | 2030           |

### TRANSPORTATION/LAND USE MEASURES:

The use of motor vehicles for transporting people and products generated approximately 56% of Anderson's communitywide GHG emissions in 2008. The transportation-related measures described on the following pages describe the City's efforts to reduce auto-dependence in new development and improve biking and walking infrastructure within the community.



## Measure T-1: Mixed Use Development

**2020 GHG Reduction Potential: 263 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,014 MT CO<sub>2</sub>e/yr**

Research demonstrates that average daily shopping and errand trips in well serviced neighborhoods are less than half the distance than in neighborhoods with low levels of diversity. This research also indicates that residents who live within a ¼ to ½ - mile of neighborhood commercial centers are more likely to walk or bike in order to purchase daily goods and services. Enhancing the quality and diversity

of uses in the City's neighborhood commercial centers will help decrease transportation-related GHG emissions and improve residents' quality of life.

Anderson's 2007 General Plan Update emphasizes the need for planning for the health and safety of residents, and the development of a multi-modal transportation system that benefit healthy lifestyle and connectivity at all levels. Encouraging infill mixed-use development in close proximity to the Old Town Core is an important land use policy of the 2007 General Plan Update. The City currently maintains approximately 60 acres of downtown mixed-use development and high density residential, where residents can enjoy the convenience of being within walking and biking distance from major amenities.

To promote a healthier car-free lifestyle, the City will provide streamlined permit processing and continue to seek grant funding for higher density residential and mixed-use development. The City will continue to evaluate additional areas in the City and consider adopting mixed-use residential, commercial, and office zoning to encourage active circulation (walking and bicycling) to reduce dependence on cars and therefore, help to reduce the household average VMT.

| ACTION              |  | RESPONSIBILITY      |
|---------------------|--|---------------------|
| <b>Short-Term</b>   |  |                     |
| <b>A</b>            | Conduct a community visioning process to identify the goals for commercial center retrofits and new mixed-use centers, and recommend sites with the highest potential. | Planning Department |
| <b>B</b>            | Create streamlined permitting process for higher density and mixed-use developments.   | Planning Department |
| <b>Medium-Term</b>  |  |                     |
| <b>C</b>            | Develop commercial center retrofit and mixed-use development design guidelines.  | Planning Department |
| PROGRESS INDICATORS |  | YEAR                |
| <b>1</b>            | 100% of all new residential units constructed in mixed-use development.  | 2020                |
| <b>2</b>            | 100% of all new residential units constructed in mixed-use development.  | 2035                |



## Measure T-2: Bicycle Lane Expansion

**2020 GHG Reduction Potential: 23 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 95 MT CO<sub>2</sub>e/yr**

In 2007, Anderson adopted the City's Bicycle Transportation Plan in compliance with the California Bicycle Transportation Act (*California Streets and Highway Code, Chapter 8, Article 3, Section 891.2*). While the City's Bicycle Transportation Plan addresses bicycle facilities specifically for the incorporated area of the City, it references the Shasta County Regional Bikeway Plan to address regional facilities and coordination among local agencies. Currently, the City has 0.3 miles of Class 1 bikeways, 3.5 miles of Class 2 bikeways and 1 mile of Class 3 bikeways within the City limits. In addition, the City also has 2.5 miles of Class 1 bikeways in the Anderson River Park, several miles of off-road trails adjacent to the Sacramento River, and numerous other unimproved trails. Per the 2007 Bicycle Transportation Plan, the City of Anderson proposes to expand bicycle infrastructure by adding:



- 0.9 miles of Class 1 Bikeways (off-road bike path)
- 8 miles of Class 2 Bikeways (striped lane for one-way bike travel )
- 1 mile of g Class 3 Bikeways (shared path with pedestrians and motor vehicles)

The City of Anderson will continue to require appropriate land development construction to complete portions of the plan. In addition, the City will leverage Bicycle Transportation Account and Safe Routes to School grant funds with local funding to secure funding for all proposed projects.

| ACTION              |   | RESPONSIBILITY   |
|---------------------|---|--|
| <b>Short-Term</b>   |   |  |
| <b>A</b>            | Continue to pursue grant funding opportunities to implement the Anderson Bicycle Transportation Plan. | Planning Department;<br>Public Works                   |
| <b>B</b>            | Establish standards for the ratio of bicycle lanes and paths to mile of road                          | Planning Department                                    |
| <b>C</b>            | Develop design guidelines and design standards to promote installation of bicycle infrastructure.     | Planning Department                                    |
| <b>Medium-Term</b>  |   |  |
| <b>D</b>            | Develop appropriate bicycle infrastructure for high traffic street segments and intersections.        | Public Works;<br>Development and<br>Community Services |
| <b>E</b>            | Implement a bicycle way finding / signage program.  | Public Works;<br>Development and<br>Community Services |
| PROGRESS INDICATORS |   | YEAR   |
| <b>1</b>            | 20 new miles of Class I and II bicycles lanes constructed.  | 2020   |
| <b>2</b>            | 45 new miles of Class I and II bicycles lanes constructed.  | 2035   |



## Measure T-3: Pedestrian Environment Enhancements

**2020 GHG Reduction Potential: 352 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 460 MT CO<sub>2</sub>e/yr**

A well connected network of sidewalks, trails, and crosswalks creates a pedestrian environment that encourages walking and improves community health. In 2011, Anderson received a Caltrans Community Based Transportation Planning (CBTP) grant to prepare a Pedestrian Accessibility and Safety Plan. The goal of this plan is to assess overall functionality of pedestrian transit to guide future pedestrian projects towards improving mobility and safety. The City conducted outreach with diverse groups, work with stakeholders and citizens to identify pedestrian needs, hazards and barriers of pedestrian transit, develop a vision statement, prioritize improvements and identify funding sources for future improvements. The final product of this grant was a Pedestrian Master Plan.

Based on the findings of the Pedestrian Master Plan, the City will continue to pursue Safe Routes to

School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements. The City will also continue to pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network, and the extensions of existing sidewalks to provide access to desired areas of the City.

All new discretionary projects will develop multiuse trails that connect to regional trails and link neighborhoods to schools, shopping areas, areas of employment and recreational areas, when feasible.

| ACTION              |  | RESPONSIBILITY            |
|---------------------|--|---------------------------|
| <b>Short-Term</b>   |  |                           |
| <b>A</b>            | Pursue Safe Routes-to-School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements.                    | Planning;<br>Public Works |
| <b>B</b>            | Identify existing gaps in sidewalk infrastructure within the City and develop implementation plan to remove gaps and other barriers to pedestrian connectivity in the community. | Planning;<br>Public Works |
| <b>C</b>            | Pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network.   | Planning;<br>Public Works |
| <b>Medium-Term</b>  |  |                           |
| <b>D</b>            | Develop ordinance that requires new discretionary projects to develop multiuse, when feasible.   | Planning;<br>Public Works |
| PROGRESS INDICATORS |  | YEAR                      |
| <b>1</b>            | Improve pedestrian infrastructure and conditions in 50% of streets in the community.   | 2020                      |
| <b>2</b>            | Improve pedestrian infrastructure and conditions in 100% of streets in the community.  | 2035                      |



## Measure T-4: Commute Trip Reduction

**2020 GHG Reduction Potential: 20 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 24 MT CO<sub>2</sub>e/yr**

Approximately 76% of Anderson residents commute to work by automobile, with an average auto commute length of 9 miles. The remaining 24% commute by a variety of methods, including public transportation, carpooling, bicycling, walking, and telecommuting. Social media websites and other internet-based technologies can facilitate ridesharing by connecting interested drivers and passengers. Strategic facility improvements at important public transportation nodes can also increase ridership by removing some of the perceived barriers (e.g., unpredictable arrival/departure times, unsafe/unmarked bus stops). Increasing carpooling and public transit use will reduce the total vehicle miles traveled by County residents, resulting in fewer GHG emissions.

The City will work with SCRTA and other agencies to facilitate ridesharing opportunities, including carpooling and vanpooling. Specifically, the City will work with partners to develop ride-matching systems to use current technologies (e.g., cell phone-enabled ride-match applications), and develop a ride-match social networking website and online electronic payment options. The City and SCRTA will also evaluate the need for additional park-and-ride lots, and will pursue funding for bus stop improvements, including shelters, seating, and electronic signage.

| ACTION              |  | RESPONSIBILITY |
|---------------------|--|----------------|
| <b>Short-Term</b>   |  |                |
| <b>A</b>            | Develop a ride-matching website  | SCRTA          |
| <b>B</b>            | Identify transit stops in high-activity areas that would benefit from additional enhancements (e.g., shelter, seating, electronic arrival/departure information) | SCRTA          |
| <b>C</b>            | Pursue funding for transit stop improvements   | SCRTA          |
| PROGRESS INDICATORS |  | YEAR           |
| <b>1</b>            | 10% of employees in Anderson commute via carpool or public transit   | 2020           |
| <b>2</b>            | 10% of employees in Anderson commute via carpool or public transit   | 2035           |

### CARBON SEQUESTRATION MEASURES:

As trees grow they capture and store atmospheric carbon within their trunks, branches, and roots. By planting new trees, the City can offset a portion of the community's GHG emissions. The following measure describes the City's efforts to expand its urban forest.



## Measure GI-1: Urban Forest

**2020 GHG Reduction Potential: 50 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 110 MT CO<sub>2</sub>e/yr**

An “urban forest” encompasses all of the trees in a community, from street trees and private landscapes to parks and natural, open spaces. The urban forest can shade buildings and streets, improving community comfort and reducing the need for building air conditioning. Trees also provide improved water and air quality, increased wildlife habitat, and neighborhood beautification.

Trees can help the City achieve its GHG reduction goal by reducing building energy-related emissions, as well as through carbon sequestration. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Trees with larger canopies and dense foliage provide more shade than other species. Large, deciduous species are ideal for reducing building energy as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow.

The City will continue to evaluate the carbon sequestration potential of planned urban forestry projects. The City will continue to require trees be planted in new residential developments. The City will also continue to identify potential locations for and plant additional street trees within the old town core and along pedestrian trails. Furthermore the City will develop an outreach campaign to encourage the planting of shade trees on private residential and commercial properties.

| ACTION              |   | RESPONSIBILITY            |
|---------------------|---|---------------------------|
| <b>Short-Term</b>   |   |                           |
| <b>A</b>            | Develop outreach program to advertise the benefits of planting shade trees around buildings and parking lots. | Planning                  |
| <b>B</b>            | Evaluate the carbon sequestration potential of planned urban forestry projects.                               | Planning                  |
| <b>Medium-Term</b>  |   |                           |
| <b>D</b>            | Identify potential locations and plant trees within the downtown commercial district.                         | Planning;<br>Public Works |
| PROGRESS INDICATORS |   | YEAR                      |
| <b>1</b>            | 500 new trees are planted.  | 2020                      |
| <b>2</b>            | 1150 new trees are planted.   | 2035                      |

## IMPLEMENTATION AND MONITORING

This section describes how the City will implement the emission reduction measures and actions contained in the CAP. The section contains the following three subsections:

- **Measure Implementation** - Describes how City staff will implement CAP measures and their related actions, and the role of the progress indicators and other guidance provided within the measure tables.
- **Program Evaluation and Evolution** - Discusses the need to evaluate, update, and amend the CAP over time, so, in order to ensure that the program remains effective and current.
- **Relationship to the California Environmental Quality Act** - Describes the relationship between the CAP and the California Environmental Quality Act (CEQA), and establishes criteria for City staff to use when determining if a proposed project is consistent with the document.

### MEASURE IMPLEMENTATION

Ensuring that the measures translate from policy language into on-the-ground results is critical to the success of the CAP. To facilitate this, each measure contains a table that identifies the specific actions the City will carry out. The table also identifies responsible departments for each action. The second section of each table provides progress indicators that to enable City staff, the City Council, and the public to track measure implementation and monitor overall CAP progress.

The tables provide both interim (2020) and final (2035) progress indicators where possible. Interim progress indicators are especially important, as they provide mid-course checks to evaluate if a measure is on the right path to achieving its GHG reductions.

Upon adoption of the CAP, the City departments identified will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this work action implementation. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships will need to be established. The City would also need to assess its progress towards measure implementation.

## PROGRAM EVALUATION AND EVOLUTION

The CAP represents the City's best initial attempt to create an organized, communitywide response to the threat of climate change at the time of preparation. Staff will need to evaluate the program's performance over time and be ready to alter or amend the plan if it is not achieving the reduction targets.

### Program Evaluation

Two types of performance evaluation are important: (A) evaluation of the community's overall ability to reduce GHG emissions as a whole and (B) evaluation of the performance of individual CAP measures. Communitywide emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the City versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2008 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction targets. The City will coordinate communitywide inventories in 2015, 2020, 2025, 2030, and 2035 to assess the level of GHG reduction goal attainment.

While communitywide inventories provide information about overall GHG reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures will improve staff and decision makers' ability to manage and implement the CAP. The City can promote and reinforce successful measures and reevaluate or replace underperforming ones. Evaluating measure performance will require data regarding actual community participation rates and measurement of GHG reduction capacity.

The City will coordinate measure evaluation on the same schedule as the communitywide inventories, and summarize the progress towards meeting the GHG reduction goal in a report that describes:

- Achievement of progress indicators
- Participation rates (where applicable)
- Estimated annual GHG reductions in 2020
- Remaining barriers to implementation

Importantly, a progress report on the CAP action items will also be provided to decision-makers on an annual basis. The progress report will include a brief assessment on the progress and implementation of individual CAP measures, including how new projects have incorporated relevant measures. The progress report will allow for gaps and new opportunities to be identified. It also will allow for additional measures to be added to the CAP.

It will be necessary to institute an annual monitoring program that tracks the performance of individual measures. The data collection and processing necessary to establish performance levels would be conducted by the responsible parties identified for each measure (as noted in the measure tables).

### Program Evolution

To remain relevant, the City must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and State and federal legislation will change. It is also possible that communitywide inventories will indicate that the community is not achieving its adopted goal. As part of the evaluations identified above, the City will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

## RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA Guidelines, Section 15183.5 describes the requirements for a emissions reduction plan to be able to provide tiering and streamlining benefits to future development projects. Section 15183.5(b)(1)(D) specifically states that the plan must contain measures, that if implemented on a project-by-project basis, would collectively achieve the plan's established emissions reduction target. This guidance essentially means that each future project seeking to use CEQA tiering will need to demonstrate compliance with the CAP.

### Project Consistency with the CAP

The CAP identifies both mandatory and voluntary emission reduction measures that would apply to different types of future proposed projects.

#### ***Mandatory Measures***

For each of the following mandatory measures, the CAP either reinforces the implementation of current codes and ordinances, or recommends changes to the City's codes and ordinances that would result in GHG reductions.

##### ■ **Measure BE-2: New Construction**

All new projects would be required to comply with these codes and ordinances, as applicable. This would make these measures binding and enforceable on new projects, within the meaning established by State CEQA Guidelines Section 15183.5(b)(2). The proposed project would describe how each measure would be integrated into the development in its application materials and environmental documentation.

#### ***Voluntary Measures***

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide emission reductions. These measures will be tracked to ensure participatory rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If not, then additional, more aggressive actions will be necessary to correct any short-fall.





# Chapter 4 - City of Shasta Lake

## PURPOSE

This chapter serves as the Climate Action Plan (CAP) for the City of Shasta Lake. The City has developed this plan in order to contribute to the State's climate protection efforts and to provide California Environmental Quality Act (CEQA) streamlining benefits for new residential and commercial development projects within the community. As stated in State CEQA Guidelines Section 15183.5, for a qualified greenhouse gas (GHG) reduction strategy to provide streamlining benefits for a local jurisdiction, it needs to include the following elements:

- GHG emissions for the jurisdiction need to be quantified through a comprehensive and complete inventory effort. This means identifying and analyzing GHG emissions from specific actions or categories of actions;
- GHG emissions need to be quantified for both existing and anticipated emissions over a specified time period, that result from current and planned activities within the defined jurisdiction area;
- Establish a reduction target for the jurisdiction, below which the contribution to GHG emissions from activities covered by the plan would not be considered cumulatively significant. All assumptions and calculations in making this determination should be transparent. A margin of safety should be built into the plan as well;
- Specify policies, measures, or programs, including performance standards that would collectively achieve the specified emissions reduction level if implemented as a specific project requirement or across a community as an incentive program. An overall reduction plan needs to address existing as well as new development reduction strategies, and should rely primarily on mandatory measures;
- A clearly defined mechanism to monitor the plan's implementation progress toward achieving reduction levels, and to require amendment if the plan is not achieving specified levels.
- It must be adopted in a public process following environmental review (certification of an Environmental Impact Report or adoption of a negative declaration, mitigated negative declaration or other environmental document);

The content of this chapter is structured to demonstrate compliance with these required elements and to provide the City and community with a useful resource to implement these important actions.

## GREENHOUSE GAS EMISSION INVENTORY AND FORECASTS

The following section provides a summary of the City of Shasta Lake's communitywide 2008 baseline GHG emissions inventory, the business-as-usual emissions forecasts, and the adjusted business-as-usual forecasts. Detailed information regarding the calculation and assumptions used in preparing the GHG emissions inventory and forecasts is provided in Appendix A.

### GREENHOUSE GAS EMISSIONS INVENTORY

The 2008 GHG emissions inventory serves as the foundation of the City's CAP. Using data collected from City departments, utilities, and other relevant agencies and locally-specific emissions factors, the inventory provides an accurate assessment of the sources of GHG gas emissions generated within the City of Shasta Lake or as a direct result of city operations (even if outside city limits) in the baseline year. This data allows the City to identify appropriate GHG reduction targets and strategies.

To ensure a comprehensive and complete GHG inventory, the City developed a *Full Inventory* that contains emissions from all sectors including building energy (electricity and natural gas), water (water demand and wastewater), solid waste, transportation, off-road vehicles, recreation, and stationary sources (industrial). Due to a lack of jurisdictional control over the stationary-source sector, emissions from this sector are excluded from the *Jurisdictional Inventory*. Examples of permitted stationary-source emissions that are not under the control of the City include process energy-related emissions at manufacturing facilities. These facilities and equipment are permitted by the Shasta County Air Quality Management District, and their GHG emissions would be controlled under the jurisdiction of the Air Resources Board pursuant to AB 32. The Jurisdictional Inventory is used within this CAP for the purposes of developing reduction targets and strategies.

#### Total Inventory

In 2008, the community's total baseline emissions included 215,988 metric tons of carbon dioxide equivalent emissions (MT CO<sub>2</sub>e). As shown in Figure 4.1 and Table 4.1, energy production and consumption generated the largest portion of emissions at 82,943 MT CO<sub>2</sub>e (38% of the total emissions). Stationary sources, such as Sierra Pacific Industries and Knauf Insulation, generated the second highest amount of emissions in the City at 72,038 MT CO<sub>2</sub>e (33% of the total emissions), followed by transportation emissions at 48,106 MT CO<sub>2</sub>e (22% of the total emissions). The water and off-road/recreation sectors comprise the remaining 7% of the emissions inventory.

#### Jurisdictional Inventory

With the removal of the stationary source sector emissions, the community's baseline jurisdictional inventory lowers to 143,950 MT CO<sub>2</sub>e in 2008. As shown in Figure 4.2, energy production and consumption generated 58% of total emissions, and transportation generated 33% of total emissions. The off-road/recreation, solid waste, and water sectors each contributed approximately 3%.



Figure 4.1 – 2008 Total Greenhouse Gas Emissions Inventory by Sector

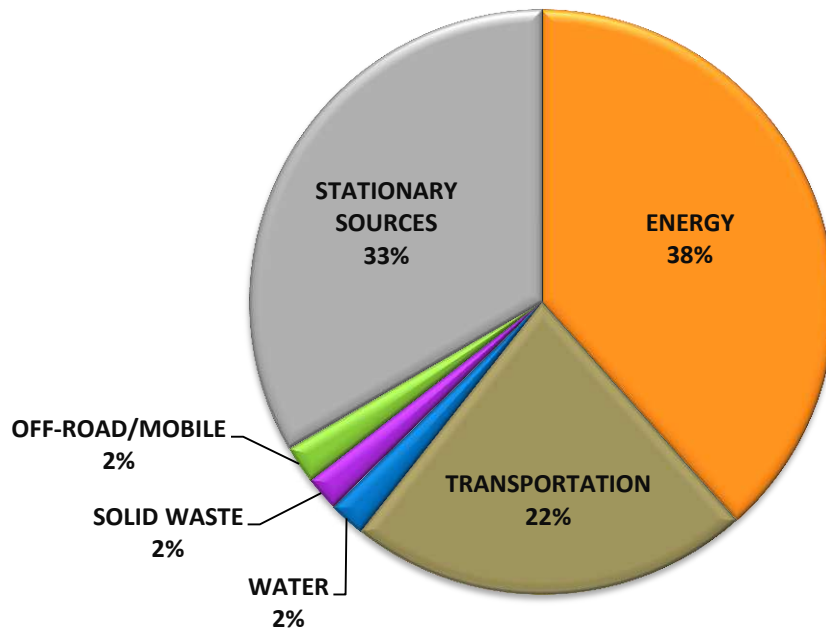
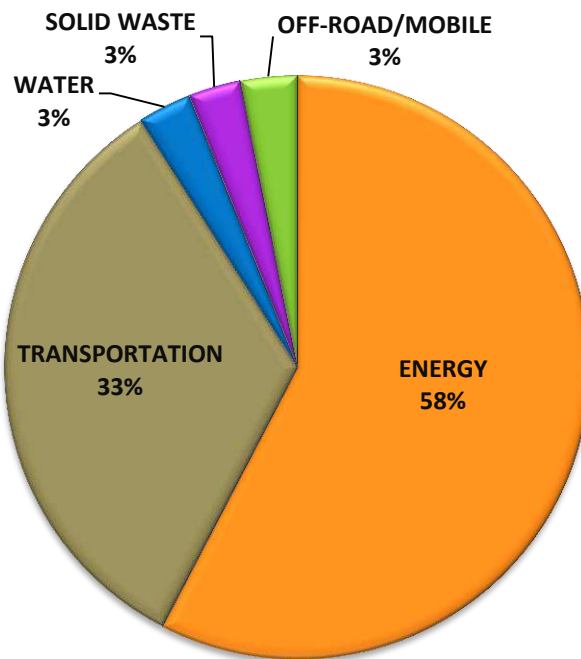


Figure 4.2 – 2008 Jurisdictional Greenhouse Gas Emissions Inventory by Sector



**Table 4.1 – Greenhouse Gas Emissions Inventory and Business-as-Usual Forecasts: 2008, 2020, 2035, and 2050**

| Sector  | 2008<br>(MT CO <sub>2</sub> e/yr) | 2020<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 | 2035<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 | 2050<br>(MT CO <sub>2</sub> e/yr) | %<br>Change<br>from<br>2008 |
|---|-----------------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|-----------------------------|
| Energy  | 82,943                            | 90,912                            | 10%                         | 107,899                           | 30%                         | 127,491                           | 54%                         |
| Transportation                                    | 48,106                            | 56,608                            | 18%                         | 78,196                            | 63%                         | 104,443                           | 117%                        |
| Solid Waste                                       | 4,139                             | 4,658                             | 13%                         | 5,369                             | 30%                         | 6,021                             | 45%                         |
| Water   | 4,273                             | 4,808                             | 13%                         | 5,543                             | 30%                         | 6,216                             | 45%                         |
| Off-Road and<br>Recreation                        | 4,489                             | 5,051                             | 13%                         | 5,822                             | 30%                         | 6,530                             | 45%                         |
| Stationary<br>Sources<br>(Non-<br>Jurisdictional) | 72,038                            | 72,038                            | 0%                          | 72,038                            | 0%                          | 72,038                            | 0%                          |
| <b>TOTAL INVENTORY</b>                            | <b>215,988</b>                    | <b>234,075</b>                    | <b>8%</b>                   | <b>274,867</b>                    | <b>27%</b>                  | <b>322,739</b>                    | <b>49%</b>                  |
| <b>JURISDICTIONAL<br/>INVENTORY</b>               | <b>143,950</b>                    | <b>162,037</b>                    | <b>13%</b>                  | <b>202,829</b>                    | <b>41%</b>                  | <b>250,700</b>                    | <b>74%</b>                  |

## BUSINESS –AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Developing realistic GHG emission forecasts is a critical step in preparing a CAP. Emission forecasts estimate future emissions levels and provide insight regarding the scale of reductions necessary to achieve an emissions target. The City has prepared GHG forecasts for 2020, 2035, and 2050 horizon years.

The City’s emissions are forecasted to be 162,037 MT CO<sub>2</sub>e in 2020, 202,829 MT CO<sub>2</sub>e in 2035, and 250,700 MT CO<sub>2</sub>e in 2050, representing growth of 13%, 41%, and 74%, respectively, from the 2008 baseline emissions. Table 4.1 shows that while emissions are forecasted to increase in all sectors, transportation-related emissions are anticipated to increase at a greater rate than other sectors.

The forecasts were established using sector-specific growth factors (e.g., energy demand forecasts) or the City’s population and employment growth projections. When based on population and employment growth projections, the GHG forecasts assume that baseline year activity intensity (e.g., solid waste generation per capita) will continue into the future. The business-as-usual GHG forecasts do not include emission reductions associated with State GHG reduction programs or implementation of the local actions described in this CAP.

The forecasts were developed for planning purposes and represent the best-available estimates. Given the complexity of each emissions sector and the unpredictable nature of market conditions, human behavior and demographics, they will need to be updated in the future as data becomes available. The City will reevaluate the forecasts throughout the CAP implementation process.

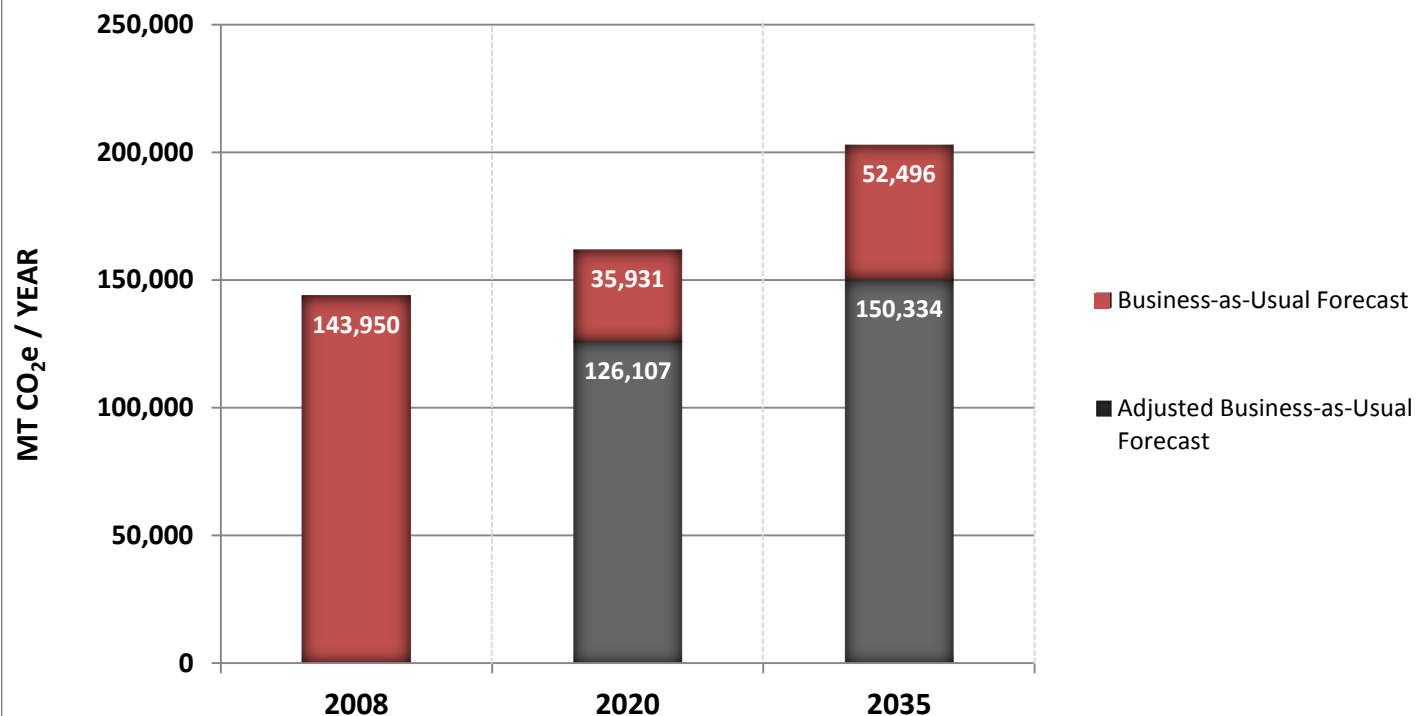
## ADJUSTED BUSINESS –AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Table 4.2 describes the emission reductions anticipated to occur within the community through implementation of State and federal policies and regulations. The largest anticipated reductions are from State and federal fuel efficiency improvements to passenger vehicles and light-duty trucks. As residents and businesses replace older vehicles with newer ones, people will consume less fuel and generate fewer emissions per vehicle mile traveled. California's low carbon fuel standard will also reduce transportation-related emissions in the community by requiring a transition away from fossil fuels (i.e., gasoline and diesel) toward lower-carbon bio-fuels (e.g., ethanol). California law also requires all utilities to obtain 33% of their electricity from renewable energy sources by 2020. In 2008, about 12% of the Shasta Lake Electric Utility's portfolio was generated from renewable sources. This increase in renewable electricity will reduce the community energy-related emissions. The medium- and heavy-duty vehicle efficiency improvements program and California Energy Code (Title-24) requirements for new construction will create smaller, but still important, communitywide emission reductions.

State and federal actions that reduce communitywide emissions in Shasta Lake will make it easier for the community to achieve 2020 and 2035 emission reduction goals. As shown in Table 4.2 and Figure 4.3, with implementation of State and federal actions, communitywide emissions would be 126,107 MT CO<sub>2</sub>e/yr in 2020 and 150,334 MT CO<sub>2</sub>e/year in 2035.

**Table 4.2 – Emission Reductions from State and Federal Actions  
2020 and 2035**

| <b>State or Federal Action</b>                                   | <b>2020 Reduction<br/>(MT CO<sub>2</sub>e/year)</b> | <b>2035 Reduction<br/>(MT CO<sub>2</sub>e/year)</b> |
|--|---|---|
| Passenger vehicle and light-duty truck fuel efficiency standards | 11,931  | 25,083  |
| Low Carbon fuel standard   | 5,462   | 6,173   |
| Non-Pavley Passenger Vehicle Efficiency Programs                 | 1,429   | 1,954   |
| Medium- and heavy-duty vehicle efficiency improvement program    | 347   | 489   |
| 2008 and 2013 California Title-24 standards                      | 200   | 462   |
| Renewable portfolio standard (33% by 2020)                       | 16,562  | 18,335  |
| <b>Total</b>   | <b>35,931</b>                                       | <b>52,496</b>                                       |

**FIGURE 4.3 - BUSINESS-AS-USUAL & ADJUSTED BUSINESS-AS-USUAL EMISSIONS FORECASTS**

## GREENHOUSE GAS EMISSION REDUCTION TARGETS

The City has selected emission reduction targets that are both ambitious and practical. The targets will allow the City to contribute to State climate protection efforts and are purposely set at levels that are likely to provide CEQA streamlining benefits to new development projects in the community. Shasta Lake's GHG reduction targets are as follows:

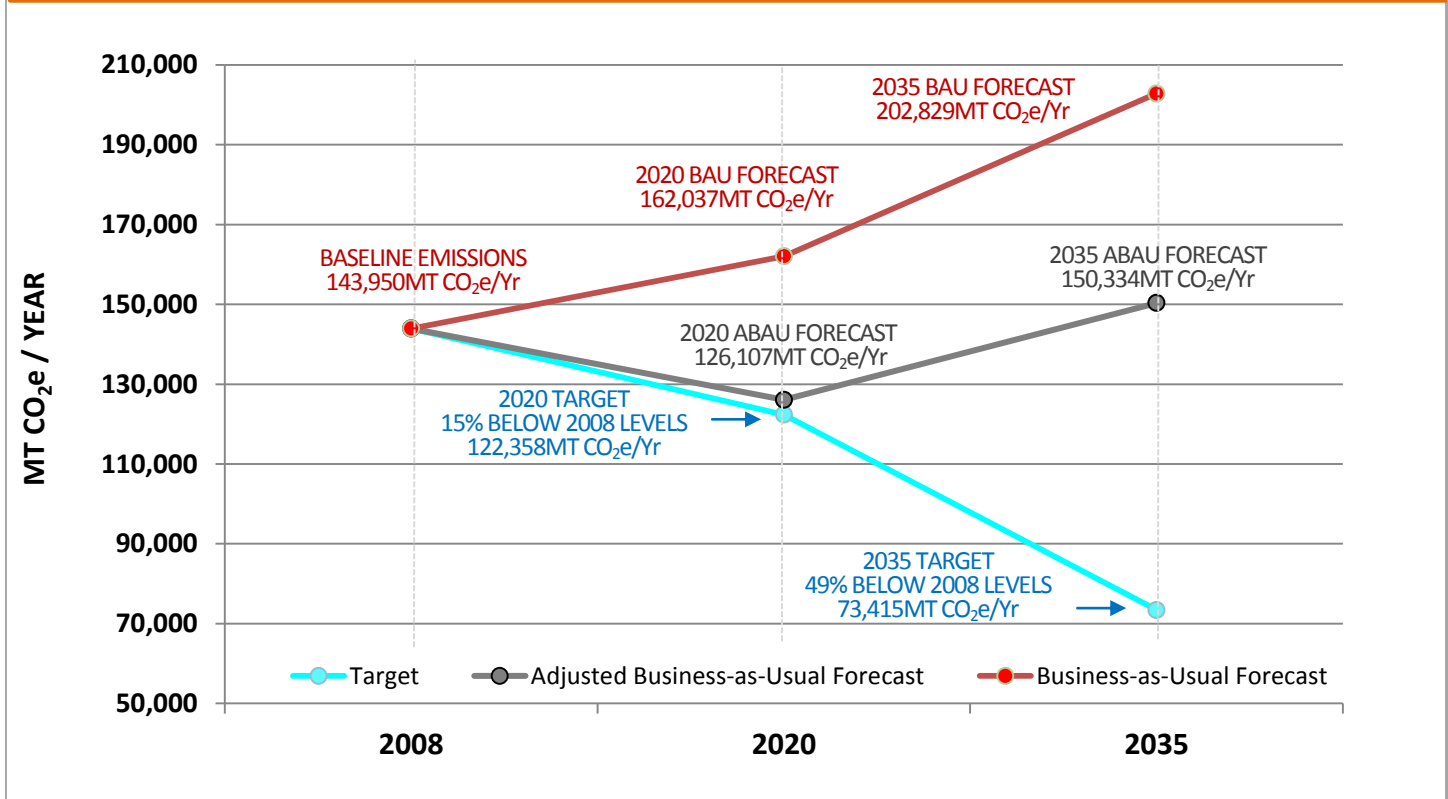
- Reduce community emissions to 15% below 2008 levels by 2020 (122,358 MT CO<sub>2</sub>e/yr)
- Reduce community emissions to 49% below 2008 levels by 2035 (73,415 MT CO<sub>2</sub>e/yr)
- Reduce community emissions to 83% below 2008 levels by 2050 (24,472 MT CO<sub>2</sub>e/yr)

The California Global Solutions Warming Act (AB 32) requires the State to reduce statewide GHG emissions to 1990 levels by 2020. The City selected its 2020 target in order to contribute the community's fair share to this near-term effort. This target aligns with direction provided by the California Air Resources Board. Executive Order S-03-05 directs the State to reduce emissions to 80% below 1990 levels by 2050. In order to contribute to this long-term effort, the City strives to achieve an equivalent goal of reducing community emissions to 83% below 2008 levels in the same time period. To be on a path toward that goal, the City will need to reduce emissions to a level 49% below 2008 by 2035. Calculations showing the logic of this interim goal can be examined in Appendix D.

This CAP describes measures that can achieve the 2020 reduction target and work toward the 2035 target. While the City supports the goal of Executive Order S-03-05, it recognizes that estimating 2050

emission levels and reduction potentials are highly speculative. For this reason, the City has chosen not to focus on the 2050 reduction target at this time. The City will regularly re-evaluate its long-term GHG reduction efforts to reflect future conditions and adjust emission reduction measures accordingly.

**FIGURE 4.4 - GREENHOUSE GAS REDUCTION TARGETS 2020 & 2035**



## GREENHOUSE GAS EMISSION REDUCTION MEASURES

To meet its adopted emissions reduction targets, the City will implement policies, programs, and other projects related to energy, solid waste, water, transportation, and carbon sequestration. This section provides a summary of the CAP's overall emissions reduction potential and describes the measures that the City will use to implement the local actions.

### SUMMARY OF REDUCTIONS

Table 4.3 describes the emissions reduction potential of the City's adopted CAP measures. In 2020, local actions are anticipated to reduce approximately 4,962 MT CO<sub>2</sub>e/yr. The solid waste-related measures are expected to provide the largest portion, 54%, of the local reductions. The energy-related measures will provide around 29%, followed by transportation (7%), water (6%), and carbon sequestration (4%). Table 4.4 and Figure 4.5 illustrate that together the local and state actions are expected to reduce communitywide emissions to approximately 15.8% below 2008 baseline emissions levels, surpassing the adopted 2020 target (15% below 2008 levels) by 1,213 MT CO<sub>2</sub>e/yr. This estimated level of reduction conforms to the CEQA requirements for a qualified GHG reduction strategy and can be expected to provide streamlining benefits for compliant projects constructed within the jurisdiction prior to 2020.

In 2035, local actions are anticipated to reduce approximately 9,148 MT CO<sub>2</sub>e/yr. The source of reductions is very similar to those in 2020, with solid waste and energy-related measures contributing the two highest proportions. Local and state actions are expected to reduce communitywide emissions to approximately 1.9% below 2008 baseline emissions levels, a level that falls short of the City's adopted 2035 target (49% below 2008 levels). The City anticipates that new technologies and State or federal policies will be developed and will assist the community achieve this longer-term goal.

**Table 4.3 – Quantified Greenhouse Gas Reductions**

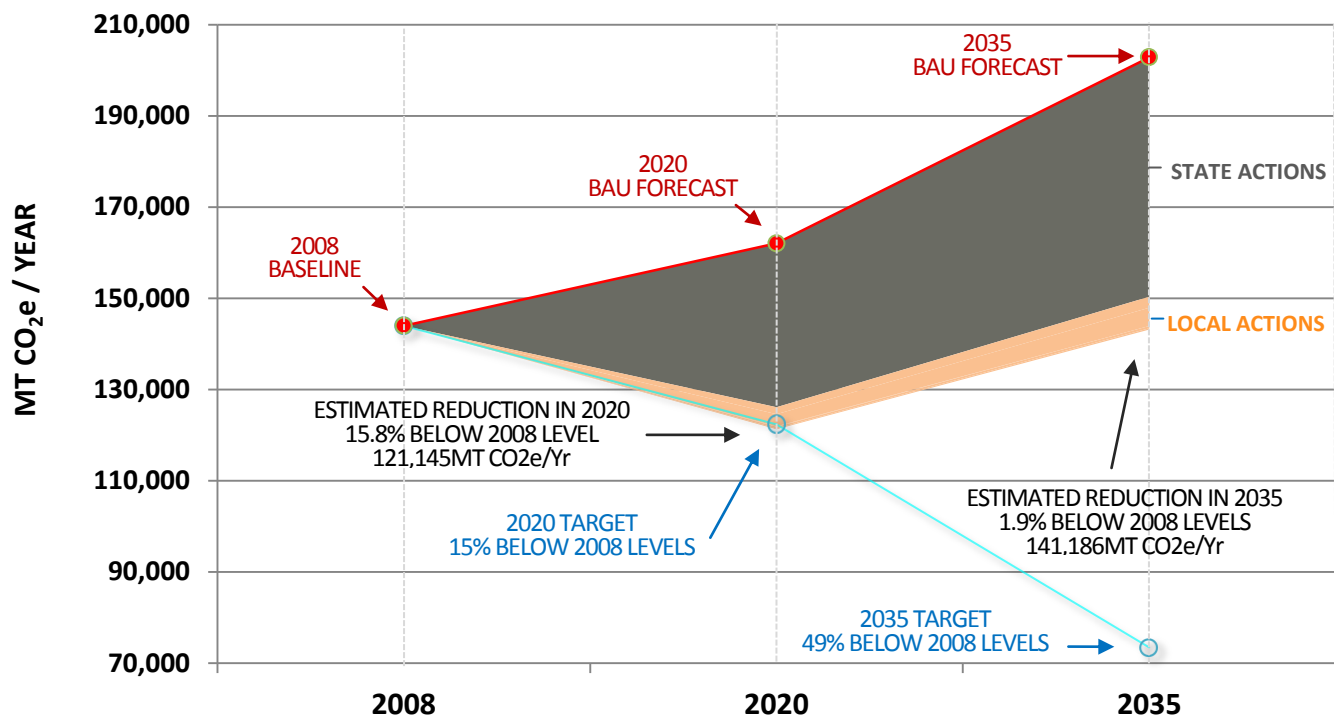
| Sectors and Measures                 |                                     | 2020<br>(MT CO <sub>2</sub> e/yr) | 2035<br>(MT CO <sub>2</sub> e/yr) |
|--------------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|
| <b>Building Energy</b>               |                                     |                                   |                                   |
| BE-1                                 | Existing Buildings                  | 25                                | 56                                |
| BE-2                                 | New Construction                    | 0                                 | 0                                 |
| BE-3                                 | Commercial Lighting                 | 137                               | 236                               |
| BE-4                                 | Efficient Appliances                | 173                               | 625                               |
| BE-5                                 | Solar Water Heaters                 | 254                               | 668                               |
| BE-6                                 | Solar Photovoltaic Systems          | 867                               | 2007                              |
| <b>Subtotal</b>                      |                                     | <b>1,455</b>                      | <b>3,591</b>                      |
| <b>Water</b>                         |                                     |                                   |                                   |
| W-1                                  | Water Conservation                  | 314                               | 355                               |
| <b>Subtotal</b>                      |                                     | <b>314</b>                        | <b>355</b>                        |
| <b>Solid Waste</b>                   |                                     |                                   |                                   |
| SW-1                                 | Enhanced Organic Waste Diversion    | 118                               | 312                               |
| SW-2                                 | Methane Recovery                    | 2,551                             | 3,207                             |
| <b>Subtotal</b>                      |                                     | <b>2,669</b>                      | <b>3,519</b>                      |
| <b>Transportation</b>                |                                     |                                   |                                   |
| T-1                                  | Mixed-Use Development               | 290                               | 1,093                             |
| T-2                                  | Bicycle Lane Expansion              | 14                                | 54                                |
| T-3                                  | Pedestrian Environment Enhancements | 31                                | 97                                |
| <b>Subtotal</b>                      |                                     | <b>335</b>                        | <b>1,243</b>                      |
| <b>Carbon Sequestration</b>          |                                     |                                   |                                   |
| CS-1                                 | Urban Forestry                      | 190                               | 440                               |
| <b>Subtotal</b>                      |                                     | <b>190</b>                        | <b>440</b>                        |
| <b>TOTAL LOCAL ACTION REDUCTIONS</b> |                                     | <b>4,962</b>                      | <b>9,148</b>                      |

Table 4.4 - Reduction Potential of City's CAP Measures

|  | 2008     | 2020                          |                      |                           | 2035                          |                      |                           |
|--|----------|-------------------------------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|
|  | Baseline | BAU                           | ABUA                 | ABUA + Local CAP Measures | BAU                           | ABUA                 | ABUA + Local CAP Measures |
| <b>GHG Emissions (MT CO<sub>2</sub>e/Yr)</b> | 143,950  | 162,037                       | 126,107              | 121,145                   | 202,829                       | 150,334              | 141,186                   |
| <b>Change from Baseline</b>                  | NA       | 12.6%                         | -12.4%               | -15.8%                    | 40.9%                         | 4.4%                 | -1.9%                     |
| <b>CAP GHG Reduction Targets</b>             | NA       | Target = 15% below 2008 level | Does Not Meet Target | Meets Target              | Target = 49% below 2008 level | Does Not Meet Target | Does Not Meet Target      |

Figure 4.5 demonstrates the relative contribution of State and the City's local actions. While the State actions provide the majority of reductions in 2020, the local actions are necessary to achieve the target. In 2035, State and local reductions increase in scale, but do not provide enough reductions to counteract the community's forecasted emissions growth or the more aggressive 2035 target.

FIGURE 4.5: EMISSIONS REDUCTION POTENTIAL OF STATE AND LOCAL ACTIONS



## REDUCTION MEASURES

The CAP measures define the programs, policies, and projects that the City will undertake to accomplish its emission reduction objectives. Within this section, the measures are organized into four categories including: energy, solid waste, transportation, and carbon sequestration. Each category begins with an introduction followed by the pages that describe the component measures. Appendix D includes estimated costs for measure implementation.

### Measure Structure

To aid the reader and to facilitate implementation of the CAP, each measure contains the following information:

- **Emission Reductions** - Reduction potential values are provided after each measure title, and identify the estimated annual emission reductions anticipated in 2020 and 2035 in MT CO<sub>2</sub>e/yr. All measures have a quantifiable GHG reduction potential.
- **Description** - Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide guidance that will be used in program implementation or highlight the City's actions to date that relate to a particular measure.
- **Actions and Progress Indicators** - Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the City will take to implement the measure. The table also identifies responsible departments. Progress indicators enable staff, the City Council, and the public to track implementation and monitor overall CAP progress. Specific progress indicators are provided for both 2020 and 2035.

### ENERGY MEASURES:

The use of electricity and natural gas within residential, commercial, and industrial buildings generated over 58% of Shasta Lake's communitywide GHG emissions in 2008. The energy measures described on the following pages recommend ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase the use of renewable energy.



### Measure BE-1: Energy Efficiency Retrofits

**2020 GHG Reduction Potential:** 25 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 56 MT CO<sub>2</sub>e/yr

Fifty eight percent of homes in Shasta Lake were built before the State of California adopted the Title 24 energy efficiency requirements in 1980. Energy efficiency retrofits help residents reduce their utility bills and the community's building-related emissions. Energy audits can identify inefficient heating and cooling systems and gaps in the building's envelope through which heat can escape or enter. Audits can also help homeowners and building owners prioritize cost-effective retrofit investments to maximize their financial returns.

In 2007, the City began outreach efforts to promote energy efficiency retrofits in existing residential buildings. The Shasta Lake Electric Utility manages a strong and comprehensive energy efficiency incentive program for residential and commercial customers focusing on peak load reduction, energy conservation, and renewable energy generation. Existing programs include:



**Energy efficiency hotline:** A toll free line is available for the residential customers to answer questions and provide information on energy efficiency and energy savings-related topics.

**Free residential energy audits:** City energy specialists provide on-site audits of homes and recommend energy efficiency measures upon customer request. Customers are also provided a written report summarizing all findings.

**Free commercial energy audits:** City energy specialists provide on-site audits of commercial and industrial customers. The City also schedules follow-up visits during the audit and provides rebates for upgrades to ensure proper implementation of recommended energy efficiency measures. Post-installation verification services are also provided by the City utility department.

**Residential rebate programs:** The City provides comprehensive technical support and incentives for installing high-efficiency cooling and refrigeration equipment, envelope measures, Energy Star appliances and lighting upgrades.

**Weatherization incentives:** Financial incentives are provided to homeowners who want to invest in weatherization measures, including insulation and window treatments/replacements.

**“Kill a Watt” program:** Residents can check out a P3 Kill-a-Watt power meter free of charge for 15 days. These meters display the total consumption of 120 volt appliances to help residents understand which appliances in their home consume the most energy.

**One-stop permit center:** The City provides information regarding energy conservation methods to owners of older homes, landlords, new homeowners and owners undertaking renovations.

The City will continue to expand programs that promote energy efficiency retrofits in existing residential buildings. The City will use newspaper advertisements, website promotion and community event giveaways as part of education outreach efforts based on funding availability. The City will also encourage use of other available resources such as California Flex Your Power, the Department of Energy’s (DOE) Weatherization Assistance Program, and PG&E’s SmartEnergy Analyzer™ program, all of which link residential property owners to educational and financial resources. The City will emphasize voluntary participation in these energy efficiency retrofit programs, in lieu of mandatory requirements.

| ACTION              |   | RESPONSIBILITY                            |
|---------------------|---|---|
| <b>Short-Term</b>   |   |   |
| <b>A</b>            | Continue to promote and improve utility incentives for energy conservation programs for older homes and renovations through the One-Stop Permit Center and Electric Utility Department.                                 | Development Services;<br>Electric Utility |
| <b>B</b>            | Facilitate the use of energy efficient demonstration homes as an education and promotion tool.  | Development Services                      |
| PROGRESS INDICATORS |   | YEAR                                      |
| <b>1</b>            | 2% of existing single family residential units and 2% of multi-family residential units perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, AC refrigerant recharge)         | 2020                                      |
| <b>2</b>            | 4.5% of existing single family residential units and 4.5% of multi-family residential units perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, and AC refrigerant recharge) | 2035                                      |



## Measure BE-2: New Construction

**2020 GHG Reduction Potential:** Included in Title-24 State Reductions

**2035 GHG Reduction Potential:** Included in Title-24 State Reductions

The City has been proactive about promoting building energy efficiency through utility incentives and streamlined permitting. The City maintains a One-Stop Permit Center that, in coordination with the Electric Utility Department, provides information on energy efficient construction and operations to builders and new home owners through newspaper advertisement, website promotion and community event giveaways. Contingent upon future availability of funding, the City will continue to promote and improve utility incentives and distribution of building performance-related information.

The 2010 CalGreen Building Code (CalGreen) sets guidance for higher building performance standards. CalGreen offers two voluntary compliance pathways to achieve 15% and 30% energy efficiency above the State's 2008 Title 24 Energy Code efficiency requirements. Contingent upon funding availability, the City will offer priority permitting to new residential projects that demonstrate 15% higher energy efficiency than Title 24 requirements. These efforts will serve to increase energy efficiency of new residential buildings and would help to lower homeowners utility bills.

Additional energy savings are anticipated to be created through the 2013 update of the State's Title 24 standards. All new construction developed between 2010 and 2015 has been, or will be, required to meet the 2008 Title-24 requirements. All new construction developed between 2015 and 2020 will be required to comply with the updated 2013 Title 24 requirements that the California Energy Commission estimates will be 20-25% more energy efficient than the 2008 standards. The City anticipates that more than 50% of all new construction in the City will be subject to the 2013 Title 24 standards. The City's CAP includes reductions associated with the 2008 and 2013 Title 24 standards with the statewide reductions (see Appendix B for details). Further increases in Title 24 standards are anticipated after 2017 but are too speculative at this point in time to quantify.

Because the State develops the Title 24 standards for each code period with the goal of balancing energy efficiency and cost-effectiveness, the City believes it is not prudent to require efficiency at a level higher than the State's standard. The City will not adopt an efficiency standard more stringent than the State's code.

| ACTION              |  | RESPONSIBILITY                            |
|---------------------|--|---|
| <b>Short-Term</b>   |  |   |
| <b>A</b>            | Continue to promote and provide utility incentives for energy efficiency programs in new residential buildings through the One-Stop Permit Center and Electric Utility Department. | Electric Utility;<br>Development Services |
| <b>B</b>            | Develop a priority permitting program for new residential projects that demonstrate 15% higher efficiency than Title 24 requirements.  | Development Services                      |
| PROGRESS INDICATORS |  | YEAR                                      |
| <b>1</b>            | 50% of new construction to achieve 25% reduction in energy use above 2008 Title 24 energy efficiency standards.  | 2020                                      |
| <b>2</b>            | 80% of new construction to achieve 25% reduction in energy use above 2008 Title 24 energy efficiency standards.  | 2035                                      |



## Measure BE-3: Commercial Lighting

**2020 GHG Reduction Potential:** 137 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 236 MT CO<sub>2</sub>e/yr

There is approximately 300,000 square feet of non-residential building space in Shasta Lake. Conventional commercial lighting used to illuminate these buildings, including T12 fluorescent bulbs, consumes more energy than new T8 or T5 lights, light-emitting diodes (LED), and other efficient lighting technologies. Retrofitting existing commercial interior lighting is a relatively easy upgrade to make, and rebate programs are available to reduce the already short simple payback period.

The City currently provides a commercial lighting retrofit program to all businesses, to replace old inefficient T-12 fixtures with energy-efficient fluorescent lighting. The lighting upgrade program includes rebates for fixtures, lamps, accent/directional lighting, controls and occupancy sensors, and signage.

The City will continue promotion of this program to the community's businesses and institutional building owners. The City will expand this program to also focus on parking lot and public area lighting.

| ACTION              |   | RESPONSIBILITY   |
|---------------------|---|------------------|
| <b>Short-Term</b>   |   |                  |
| <b>A</b>            | Continue to promote and provide utility incentives for commercial interior lighting retrofits.                                    | Electric Utility |
| <b>Medium-Term</b>  |   |                  |
| <b>B</b>            | Develop a parking lot and public area lighting-specific outreach program.   | Electric Utility |
| PROGRESS INDICATORS |   | YEAR             |
| <b>1</b>            | 90% of businesses improve interior lighting efficiency by 40% and 20% of businesses improve exterior lighting efficiency by 20%.  | 2020             |
| <b>2</b>            | 100% of businesses improve interior lighting efficiency by 40% and 45% of businesses improve exterior lighting efficiency by 40%. | 2035             |



## Measure BE-4: Efficient Appliances

**2020 GHG Reduction Potential:** 173 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 625 MT CO<sub>2</sub>e/yr

This measure is designed to encourage voluntary community participation to upgrade home appliances to Energy Star or other energy efficient models. Modern technology has contributed to the development of high-quality, energy efficient appliances. The Energy Star rating is a nationally recognized standard for energy efficient consumer products. According to the EPA, devices that have an Energy Star certification, such as office equipment, home appliances, and lighting products, generally use 20 to 30 percent less energy than required by federal standards.

The City provides one of the highest rebate programs in the State. The City will continue to promote appliance rebate programs through additional outreach to residents and businesses through newspaper advertisements, website promotion and community event giveaways, contingent upon available

funding. The City will also work to leverage Energy Upgrade California program materials and rebates to increase communitywide awareness regarding energy efficient appliance choices. By promoting Energy Star-rated home and business appliances, the City can help to reduce GHG emissions related to the use of lighting, refrigerators, dishwashers, clothes washers, wall air conditioning units, computers, photocopiers, lights, etc.

The City will continue to provide comprehensive technical support and incentives for installing high-efficiency cooling and refrigeration equipment, and Energy Star appliances. As part of this service, the City will continue to promote its “Kill-a-Watt” Power Meter Program. This program, managed through an online application on the City’s website, allows residents to check out a P3 Kill-a-Watt power meter for no charge up to 15 days. These meters display the total consumption of 120 volt appliances to help residents understand which appliances in their homes consume the most energy and then adjust the time of use of high energy-using appliances to save on utility bills.

| ACTION              |  | RESPONSIBILITY                           |
|---------------------|--|--|
| <b>Short-Term</b>   |  |  |
| <b>A</b>            | Continue community educational outreach and distribution of information regarding efficient appliances and utility rebate programs through the One-Stop Permit Center and Electric Utility Department.   | Development Services<br>Electric Utility |
| <b>B</b>            | Continue the Kill-a-Watt program.  | Electric Utility                         |
| PROGRESS INDICATORS |  | YEAR                                     |
| <b>1</b>            | 20% of existing homes will replace old model refrigerators, dishwashers, and clothes washers with new Energy Star models.<br>80% of new homes will install Energy Star refrigerators, and 90% of new homes will install Energy Star dishwashers and clothes washers. | 2020                                     |
| <b>2</b>            | 45% of existing homes will replace old model refrigerators, dishwashers, and clothes washers with new Energy Star models.<br>90% of new homes will install Energy Star refrigerators, dishwashers and clothes washers.   | 2035                                     |



## Measure BE-5: Solar Water Heaters

**2020 GHG Reduction Potential: 254 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 668 MT CO<sub>2</sub>e/yr**

Shasta Lake’s location results in a relatively high solar insolation rating (comparable to southern cities, such as Orlando, FL and New Orleans, LA), which makes it an excellent candidate for effective adoption of solar technologies. Solar hot water systems are a simple and reliable method for harnessing the sun's energy to provide for hot water needs.

Solar hot water systems can be a cost-effective replacement for inefficient water heaters. According to the California Solar Initiative (CSI), solar hot water systems can lower energy bills by meeting 50 to 80 percent of hot water needs. Though the high capital cost of solar water heater upgrades can pose a financial burden to homeowners, there are a range of financing and rebate options to offset these initial investment costs. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470), created a 10-year program aimed at installing solar water heaters in homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000-\$6,000.

The City will identify the additional financing and rebate options for residents to voluntarily replace inefficient water heating systems with solar water heaters. During retrofit the City will encourage customers to switch to electric backup water heating systems, which will result in additional GHG reductions when compared to natural gas heaters. There are a number of financing options that may be used to reduce upfront costs, such as federal tax incentives through the Energy Policy Act of 2005, and financial incentives through AB 1470. The City will work with the California Solar Initiative to create outreach programs to provide information about the benefits of solar hot water heaters to encourage participation. The City will create a streamlined permit process for solar water heater installation.

| ACTION              |  | RESPONSIBILITY                           |
|---------------------|--|--|
| <b>Short-Term</b>   |  |  |
| <b>A</b>            | Work with California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential buildings. | Development Services<br>Electric Utility |
| <b>B</b>            | Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation.  | Development Services                     |
| PROGRESS INDICATORS |  | YEAR                                     |
| <b>1</b>            | 10% of residences and businesses will install a solar hot water system.  | 2020                                     |
| <b>2</b>            | 22.5% of residences and businesses will install a solar hot water system.  | 2035                                     |



## Measure BE-6: Solar Photovoltaic Systems

**2020 GHG Reduction Potential:** 867 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 2007 MT CO<sub>2</sub>e/yr

As mentioned in Measure BE-5, Shasta Lake is a good candidate for solar technologies based on its relatively high solar insolation level. Installation of residential solar photovoltaic (PV) systems allows homeowners to take advantage of cost-saving renewable energy. In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for larger PV systems. Parking lots also provide excellent opportunities for additional solar energy generation.

Numerous barriers may prevent widespread adoption of solar PV technology including City regulations and initial up-front costs. Various options are available to assist residents and businesses in overcoming the financial burdens associated with PV installation, including rebates, incentives, and solar service providers. The City currently offers a Photovoltaic (PV) Buy-Down Program to help offset residents and businesses' investment in a PV system. The City provides rebates through this program to reduce the initial system cost for owners.

Additionally, the California Solar Initiative ([www.gosolarcalifornia.org](http://www.gosolarcalifornia.org)) offers rebates for small PV units of 30kW and less, which are suitable for households and small businesses, as well as rebates for larger systems. Solar service providers allow residents and businesses to enjoy the price-saving benefits of solar energy with little to no upfront costs by offering solar PV system design, finance, installation, and maintenance to residential and commercial customers. Customers have the option to purchase or lease a PV system or enter into a power purchase agreement (PPA) with a provider, in which they lock in their solar energy rates for the duration of their PPA contract. Customers who lease a system or enter a PPA can do so with no upfront cost; the provider installs, owns, maintains, and insures the PV system for the duration of the contract.

The City will develop a multi-pronged approach to remove barriers to PV installation. The City will review its regulations, ordinances, and codes to identify any barriers to solar project installation. The City will develop a solar outreach campaign that encourages property owners to install PV systems through streamlined permitting, reduced permitting fees, technical assistance, and information on currently available rebates or incentive programs. The City will also actively encourage residents and business owners to take advantage of cost-saving solar service providers that operate in the area.

| ACTION              |   | RESPONSIBILITY   |
|---------------------|---|------------------|
| <b>Short-Term</b>   |   |                  |
| <b>A</b>            | Review City regulations, ordinances, and codes to identify and remove, when appropriate, any barriers to solar system installation.                     | Electric Utility |
| <b>B</b>            | Develop a solar outreach campaign that encourages property owners to install PV systems and participate in PPA agreements with solar service providers. | Electric Utility |
| PROGRESS INDICATORS |   | YEAR             |
| <b>1</b>            | 3% of single-family homes install 3.0 kW solar PV systems;<br>100,000 SF of non-residential PV systems installed in the community.                      | 2020             |
| <b>2</b>            | 6.8% of single-family homes install 3.0 kW solar PV systems;<br>225,000 SF of non-residential PV systems installed in the community.                    | 2035             |

#### WATER MEASURE:

Water-related GHG emissions are mainly caused by energy used to pump, transport, heat, cool, and treat water and wastewater. Emissions associated with this energy use accounted for approximately 3% of the communitywide GHG inventory in 2008.



### Measure W-1: Water Conservation

**2020 GHG Reduction Potential:** 314 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 355 MT CO<sub>2</sub>e/yr

The State's 2009 Comprehensive Water Package (SB-7X) requires water providers who provide potable municipal water to more than 3,000 end users or that supply more than 3,000 acre-feet of potable water annually to reduce per capita water consumption by 2020 - a 20% reduction from the average water demand between 1995 and 2010. The City serves approximately 3,650 end users and, therefore, is required to comply with SB-7X. In response to this requirement, the City plans to implement a series of water conservation initiatives. This measure assumes successful achievement of the required reduction.

| ACTION   | RESPONSIBILITY                                 |
|--|--|
| <b>Medium-Term</b>   |  |
| <b>A</b> Implement conservation programs identified within the City's Water Management Plan. | Water Treatment Superintendent<br>Public Works |
| PROGRESS INDICATORS  | YEAR   |
| <b>1</b> Reduce urban water use by 20% per capita below average water demand (1995-2010)     | 2020   |
| <b>2</b> Maintain urban water use by 20% per capita below average water demand (1995-2010)   | 2035   |

### SOLID WASTE MEASURES:

The decomposition of the community's solid waste in landfills generated approximately 3% of Shasta Lake's communitywide GHG emissions in 2008. The solid waste-related measures described on the following pages recommend ways to increase diversion of organic wastes and describe the County's implementation of enhanced landfill methane capture systems.



## Measure SW-1: Enhanced Organic Waste Diversion

**2020 GHG Reduction Potential:** 118 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 312 MT CO<sub>2</sub>e/yr

Shasta Lake promotes waste diversion from landfills by providing separate waste bins for trash, recyclable items and green yard waste. In the short-term, the City will augment existing waste diversion programs, conduct a variety of outreach programs to increase participation in waste reduction, recycling and composting programs, and work with waste hauling operators to ensure achievement of this goal. Specifically the City will develop an outreach program to encourage enhanced yard waste collection and construction and demolition waste diversion. The City will enforce the State requirement that builders divert 50% of all construction and demolition related waste.

The City will also implement a commercial recycling program designed to divert commercial solid waste generated by businesses pursuant to Public Resources Code Section 42649 *et seq.* "Business" is defined as any commercial or public entity that generates four cubic yards or more of commercial solid waste per week, multi-family residential complexes of five units or more, and any other commercial entity identified by the City as being a source of commercial solid waste. Components of the program will include education and outreach to businesses, and identification and monitoring of businesses to assess compliance with the regulations.

| ACTION   | RESPONSIBILITY                        |
|--|---------------------------------------|
| <b>Short-Term</b>  |                                       |
| <b>A</b> Enhance implementation of existing recycling and composting programs through education and outreach, including specific enhanced yard waste and construction and demolition waste diversion programs. | Finance Dept.<br>Development Services |

| <b>B</b>            | Incorporate waste reduction measures into future solid waste and recycling franchise agreements. | Finance Dept.                         |
|---------------------|--|---------------------------------------|
| <b>C</b>            | Implement a commercial recycling program to divert commercial solid waste.                       | Finance Dept.<br>Development Services |
| PROGRESS INDICATORS |  | YEAR                                  |
| <b>1</b>            | Community increases diversion of yard and construction and demolition wastes by 50%.             | 2020                                  |
| <b>2</b>            | Community maintains diversion of yard and construction and demolition wastes at 50%.             | 2035                                  |



## Measure SW-2: Methane Recovery

**2020 GHG Reduction Potential:** 2,551 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 3,207 MT CO<sub>2</sub>e/yr

The Air Resources Board approved a regulation to reduce methane emissions from municipal solid waste landfills as an early implementing action of the California Global Warming Solutions Act (Assembly Bill 32). Per the regulation, methane capture facilities have been required at all municipal solid waste landfills since June 2010. Two landfills are used in Shasta County to dispose of waste from the community: the West Central Landfill and the Anderson Landfill. The West Central Landfill is currently an uncontrolled municipal solid waste landfill, meaning there is no methane capture infrastructure in place. However, the County is in the process of constructing a gas control system that would capture landfill-generated methane and direct it to a flare where it would be burned off, dramatically reducing the global warming potential of the gas. In the future, this system may be upgraded to a landfill gas-to-energy system under which an operator could construct a power plant to capture the landfill methane and burn it to generate electricity. The Anderson Landfill currently has a methane capture system in place with no plans for system upgrades.

The County's action effectively reduces the City's solid waste-related emissions. The City will consult with County staff to ensure methane capture is achieved.

| ACTION              |  | RESPONSIBILITY                      |
|---------------------|--|-------------------------------------|
| <b>Short-Term</b>   |  |                                     |
| <b>A</b>            | Consult with County staff to verify the installed methane capture system at the West Central Landfill achieves the estimated 75% control efficiency. | Wastewater Treatment Superintendent |
| PROGRESS INDICATORS |  | YEAR                                |
| <b>1</b>            | West Central Landfill achieves a methane control efficiency of 75%.  | 2020                                |
| <b>2</b>            | West Central Landfill achieves a methane control efficiency of 75%.  | 2035                                |



## TRANSPORTATION/LAND USE MEASURES:

The use of motor vehicles for transporting people and products generated approximately 33% of Shasta Lake's communitywide GHG emissions in 2008. The transportation-related measures described on the following pages describe the City's efforts to reduce auto-dependence in new development and improve biking and walking infrastructure within the community.



## Measure T-1: Mixed Use Development

**2020 GHG Reduction Potential:** 290 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 1,093 MT CO<sub>2</sub>e/yr

Research demonstrates that average daily shopping and errand trips in well serviced neighborhoods are less than half the distance than in neighborhoods with low levels of diversity. This research also indicates that residents who live within ¼ to ½ mile of neighborhood commercial centers are more likely to walk or bike in order to purchase daily goods and services. Enhancing the quality and diversity of uses in the City's neighborhood commercial areas will help decrease transportation-related GHG emissions and improve residents' quality of life.

Shasta Lake will complete a comprehensive update of the General Plan to incorporate healthy community principles and standards. The City will also provide streamlined permit processing for higher density residential and mixed-use development within the City.. Presently, most of the mixed-use development in the City is along Shasta Dam Boulevard. The City will continue to evaluate additional areas in the City and consider adopting mixed-use residential, commercial, and office zoning to encourage active circulation (walking and bicycling) to reduce dependence on cars and therefore, help to reduce the household average vehicle miles traveled (VMT).

| ACTION              |   | RESPONSIBILITY       |
|---------------------|---|----------------------|
| <b>Short-Term</b>   |   |                      |
| <b>A</b>            | Update General Plan to incorporate healthy community goals and policies.  | Development Services |
| <b>B</b>            | Conduct a community visioning process to identify the goals for commercial retrofits and new mixed-use centers, and recommend sites with the highest potential. | Development Services |
| <b>C</b>            | Create streamlined permitting process for higher density and mixed-use developments.  | Development Services |
| <b>Medium-Term</b>  |   |                      |
| <b>D</b>            | Develop commercial retrofit and mixed-use development design guidelines.  | Development Services |
| PROGRESS INDICATORS |   | YEAR                 |
| <b>1</b>            | 70% of all new residential units constructed in mixed-use development.  | 2020                 |
| <b>2</b>            | 70% of all new residential units constructed in mixed-use development.  | 2035                 |



## Measure T-2: Bicycle Lane Expansion

**2020 GHG Reduction Potential:** 14 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 54 MT CO<sub>2</sub>e/yr

As a testament to the City's commitment toward complete streets policy, the City will update the Circulation Element of the General Plan. The City understands the importance of creating a balanced multi-modal transportation network that meets the needs of all users, such as pedestrians, bicyclists, motorists, movers of commercial goods, and users of public transportation. Therefore, during project review the City will also require that bike and pedestrian connections are provided to destinations within and adjoining the project (for example, connection to transit stops, commercial/neighborhood centers, parks and schools).

Furthermore, to enhance biking infrastructure in Shasta Lake, the City will establish minimum standards for the ratio of bicycle lanes and paths to miles of road. Per the 2009 Bicycle Transportation Plan, the City of Shasta Lake currently has:

- 0.3 miles of existing Class I Bikeways (with non-standard signing & pavement delineation)
- 5.2 miles of existing Class II Bikeways
- 1.6 miles of existing Class II Bikeways (with non-standard signing & pavement delineation); and
- No existing Class III Bikeways

The City will continue to pursue grant funding for implementing the Shasta Lake Bike Plan with the goal of adding 10 miles of Class I and II bikeways by 2020; 20 miles of Class I and II bikeways by 2035; and 9 miles of Class III bikeways by 2035. The City will also seek funding to install additional Healthy Shasta Bicycle Racks.

| ACTION              |  | RESPONSIBILITY                        |
|---------------------|--|---------------------------------------|
| <b>Short-Term</b>   |  |                                       |
| <b>A</b>            | Continue to pursue grant funding opportunities to implement the Shasta Lake Bike Plan. For example, continue to pursue grant funding through Healthy Shasta to identify appropriate public locations for the installation of Healthy Shasta bicycle racks. | Public Works;<br>Development Services |
| <b>B</b>            | Establish standards for the ratio of bicycle lanes and paths to miles of road  | Public Works                          |
| <b>C</b>            | Complete design guidelines and design standards to promote installation of bicycle infrastructure.   | Development Services                  |
| <b>Medium-Term</b>  |  |                                       |
| <b>D</b>            | Develop appropriate bicycle infrastructure for high traffic street segments and intersections.   | Public Works                          |
| <b>E</b>            | Implement a bicycle way finding / signage program.   | Public Works                          |
| PROGRESS INDICATORS |  | YEAR                                  |
| <b>1</b>            | 10 new miles of Class I and II bikeways constructed.   | 2020                                  |
| <b>2</b>            | 20 new miles of Class I and II bikeways constructed.   | 2035                                  |
| <b>3</b>            | 9 new miles of Class III bikeways constructed.   | 2035                                  |



## Measure T-3: Pedestrian Environment Enhancements

**2020 GHG Reduction Potential:** 31 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 97 MT CO<sub>2</sub>e/yr

A well connected network of sidewalks, trails, and crosswalks creates a pedestrian environment that encourages walking and improves community health. The Community Health Assessment completed for the City in July 2009 identified the need for a variety of pedestrian infrastructure enhancements. The City will continue to pursue Safe Routes to School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements. The City will also continue to pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network, and the extensions of existing sidewalks to provide access to desired areas of the City.

All new discretionary projects will develop multiuse trails that connect to regional trails and link neighborhoods to schools, shopping areas, areas of employment and recreational areas, when feasible.

| ACTION              |   | RESPONSIBILITY       |
|---------------------|---|----------------------|
| <b>Short-Term</b>   |   |                      |
| <b>A</b>            | Pursue Safe-Routes-to-School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements.                       | Public Works         |
| <b>B</b>            | Identify existing gaps in sidewalk infrastructure within the City and develop an implementation plan to remove gaps and other barriers to pedestrian connectivity in the community. | Public Works         |
| <b>C</b>            | Pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network.  | Public Works         |
| <b>Medium-Term</b>  |   |                      |
| <b>D</b>            | Develop an ordinance that requires new discretionary projects to develop multiuse trails, when feasible.  | Development Services |
| PROGRESS INDICATORS |   | YEAR                 |
| <b>1</b>            | Improve pedestrian infrastructure and conditions in 3% of streets in the community.   | 2020                 |
| <b>2</b>            | Improve pedestrian infrastructure and conditions in 6.8% of streets in the community.   | 2035                 |

## CARBON SEQUESTRATION MEASURES:

As trees grow they capture and store atmospheric carbon within their trunks, branches, and roots. By planting new trees, the City can offset a portion of the community's GHG emissions. The following measure describes the City's efforts to expand its urban forest.



## Measure GI-1: Urban Forest

**2020 GHG Reduction Potential:** 190 MT CO<sub>2</sub>e/yr

**2035 GHG Reduction Potential:** 440 MT CO<sub>2</sub>e/yr

An “urban forest” encompasses all of the trees in a community, from street trees and private landscapes to parks and natural, open spaces. The urban forest can shade buildings and streets, improving community comfort and reducing the need for building air conditioning. Trees also provide improved water and air quality, increased wildlife habitat, and neighborhood beautification.

Trees can help the City achieve its GHG reduction goal by reducing building energy-related emissions, as well as through carbon sequestration. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Trees with larger canopies and dense foliage provide more shade than other species. Large, deciduous species are ideal for reducing building energy as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow.

The City will continue to evaluate the carbon sequestration potential of planned urban forestry projects. The City will continue to require trees be planted in new public projects and residential and commercial developments. The City will also identify potential locations for and plant additional street trees within the downtown commercial area, when feasible. Furthermore, the City will develop an outreach campaign to encourage the planting of shade trees on private residential and commercial properties.

| ACTION              |   | RESPONSIBILITY                       |
|---------------------|---|--------------------------------------|
| <b>Short-Term</b>   |   |                                      |
| <b>A</b>            | Develop outreach program to advertise the benefits of planting shade trees around buildings and parking lots. | Development Services                 |
| <b>B</b>            | Evaluate the carbon sequestration potential of planned urban forestry projects.                               | Electric Utility                     |
| <b>Medium-Term</b>  |   |                                      |
| <b>D</b>            | Identify potential locations and plant trees within the downtown commercial area.                             | Development Services<br>Public Works |
| PROGRESS INDICATORS |   | YEAR                                 |
| <b>1</b>            | 3,000 new shade trees are planted throughout the City.  | 2020                                 |
| <b>2</b>            | 6,750 new shade trees are planted throughout the City.  | 2035                                 |

## IMPLEMENTATION AND MONITORING

This section describes how the City will implement the emission reduction measures and actions contained in the CAP. The section contains the following three subsections:

- **Measure Implementation** - Describes how City staff will implement CAP measures and their related actions, and the role of the progress indicators and other guidance provided within the measure tables.
- **Program Evaluation and Evolution** - Discusses the need to evaluate, update, and amend the CAP over time in order to ensure that the program remains effective and current.
- **Relationship to the California Environmental Quality Act** - Describes the relationship between the CAP and the California Environmental Quality Act (CEQA), and establishes criteria for City staff to use when determining if a proposed project is consistent with the document.

### MEASURE IMPLEMENTATION

Ensuring that the measures translate from policy language into on-the-ground results is critical to the success of the CAP. To facilitate this, each measure contains a table that identifies the specific actions the City will carry out. The table also identifies responsible departments for each action. The second section of each table provides progress indicators that enable City staff, the City Council, and the public to track measure implementation and monitor overall CAP progress. The tables provide both interim (2020) and final (2035) progress indicators where possible. Interim progress indicators are especially important, as they provide mid-course checks to evaluate if a measure is on the right path to achieving its GHG reductions.

Upon adoption of the CAP, the City departments identified will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this work action implementation. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships will need to be established. The City would also need to assess its progress toward measure implementation.

### PROGRAM EVALUATION AND EVOLUTION

The CAP represents the City's best initial attempt to create an organized, communitywide response to the threat of climate change at the time of preparation. Staff will need to evaluate the program's performance over time and be ready to alter or amend the plan if it is not achieving the reduction targets.

#### Program Evaluation

Two types of performance evaluations are important: (A) evaluation of the community's overall ability to reduce GHG emissions as a whole and (B) evaluation of the performance of individual CAP measures. Communitywide emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the City versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2008 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction targets. The City will coordinate communitywide inventories in 2015, 2020, 2025, 2030, and 2035 to assess the level of GHG reduction goal attainment.

While communitywide inventories provide information about overall GHG reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction

capacity of individual measures will improve staff and decision makers' ability to manage and implement the CAP. The City can promote and reinforce successful measures and reevaluate or replace underperforming ones. Evaluating measure performance will require data regarding actual community participation rates and measurement of GHG reduction capacity.

The City will coordinate measure evaluation on the same schedule as the communitywide inventories, and summarize the progress toward meeting the GHG reduction goal in a report that describes:

- Achievement of progress indicators
- Participation rates (where applicable)
- Estimated annual GHG reductions in 2020
- Remaining barriers to implementation

Importantly, a progress report on the CAP action items will also be provided to decision-makers on an annual basis. The progress report will include a brief assessment on the progress and implementation of individual CAP measures, including how new projects have incorporated relevant measures. The progress report will allow for gaps and new opportunities to be identified. It also will allow for additional measures to be added to the CAP.

It will be necessary to institute an annual monitoring program that tracks the performance of individual measures. The data collection and processing necessary to establish performance levels would be conducted by the responsible parties identified for each measure (as noted in the measure tables).

### **Program Evolution**

To remain relevant, the City must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and State and federal legislation will change. It is also possible that communitywide inventories will indicate that the community is not achieving its adopted goal. As part of the evaluations identified above, the City will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

## **RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT**

CEQA Guidelines, Section 15183.5 describes the requirements for an emissions reduction plan to be able to provide tiering and streamlining benefits to future development projects. Section 15183.5(b)(1)(D) specifically states that the plan must contain measures, that if implemented on a project-by-project basis, would collectively achieve the plan's established emissions reduction target. This guidance essentially means that each future project seeking to use CEQA tiering will need to demonstrate compliance with the CAP. The City must complete environmental review prior to adoption of the CAP (an environmental impact report, negative declaration or mitigated negative declaration) pursuant to CEQA Guidelines Sections 15185.5(b)(1)(F) and 15183.5(b)(2) in order to allow tiering for future projects.

### **Project Consistency with the CAP**

The CAP identifies both mandatory and voluntary emission reduction measures that would apply to different types of future proposed projects.

***Mandatory Measures***

For each of the following mandatory measures, the CAP either reinforces the implementation of current codes and ordinances, or recommends changes to the City's codes and ordinances that would result in GHG reductions.

■ **Measure BE-2: New Construction**

All new projects would be required to comply with these codes and ordinances, as applicable. This would make these measures binding and enforceable on new projects, within the meaning established by State CEQA Guidelines Section 15183.5(b)(2). The proposed project would describe how each measure would be integrated into the development in its application materials and environmental documentation.

***Voluntary Measures***

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide emission reductions. These measures will be tracked to ensure participatory rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If not, then additional, more aggressive actions will be necessary to correct any short-fall.

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# Chapter 5 - City of Redding

## PURPOSE

This chapter serves as the Climate Action Plan (CAP) for the City of Redding. The City has developed this plan in order to contribute to the State's climate protection efforts and to provide California Environmental Quality Act (CEQA) streamlining benefits by eliminating the need for project-level greenhouse gas emission impact analysis and mitigation for residential and commercial development projects within the community that conform to a qualified greenhouse gas (GHG) reduction strategy. As stated in State CEQA Guidelines Section 15183.5, for a qualified GHG reduction strategy to provide streamlining benefits for a local jurisdiction, it needs to include the following elements:

- GHG emissions for the jurisdiction need to be quantified through a comprehensive and complete inventory effort. This means identifying and analyzing GHG emissions from specific actions or categories of actions;
- GHG emissions need to be quantified for both existing and anticipated emissions over a specified time period, that result from current and planned activities within the defined jurisdiction area;
- A reduction target for the jurisdiction must be established, below which the contribution to GHG emissions from activities covered by the plan would not be considered cumulatively significant. All assumptions and calculations in making this determination should be transparent. A margin of safety should be built into the plan as well;
- Specify policies, measures, programs, or performance standards that would collectively achieve the specified emissions reduction level if implemented as a specific project requirement or across a community. An overall reduction plan needs to address existing as well as new development reduction strategies and should rely primarily on mandatory measures;
- A mechanism must be included to monitor the plan's implementation progress toward achieving reduction levels, and revise if the plan is not achieving specified levels.

The content of this chapter is structured to demonstrate compliance with these required elements and to provide the City and community with a useful resource to implement these important actions.

## GREENHOUSE GAS EMISSION INVENTORY AND FORECASTS

The following section provides a summary of the City of Redding's communitywide 2008 baseline GHG emissions inventory, the business-as-usual emissions forecasts, and the adjusted business-as-usual forecasts. Detailed information regarding the calculation and assumptions used in preparing the GHG emissions inventory and forecasts is provided in Appendix A.

### GREENHOUSE GAS EMISSIONS INVENTORY

The 2008 GHG emissions inventory serves as the foundation of the City's CAP. Using data collected from City departments, utilities, and other relevant agencies and locally-specific emissions factors, the inventory provides an accurate assessment of the sources of GHG gas emissions generated within the City of Redding or as a direct result of city operations (even if outside city limits) in the baseline year. This data allows the City to identify appropriate GHG reduction targets and strategies.

To ensure a comprehensive and complete GHG inventory, the City developed a *Full Inventory* that contains emissions from all sectors including building energy (electricity and natural gas), transportation, waste, water, off-road vehicles/recreation, and stationary sources (industrial). Due to a lack of jurisdictional control over the stationary-source sector, emissions from this sector are excluded from the *Jurisdictional Inventory*. Examples of permitted stationary-source emissions that are not under the control of the City include process energy-related emissions at manufacturing facilities. These facilities and equipment are permitted by the Shasta County Air Quality Management District, and their GHG emissions would be controlled under the jurisdiction of the Air Resources Board pursuant to AB 32. The Jurisdictional Inventory is used within this CAP for the purposes of developing reduction targets and strategies.

#### Total Inventory

In 2008, the community's total baseline emissions included 1,040,919 metric tons of carbon dioxide equivalent emissions (MT CO<sub>2</sub>e). As shown in Figure 5.1 and Table 5.1, transportation generated the largest portion of emissions at approximately 502,200 MT CO<sub>2</sub>e (48% of the total emissions). Energy production and consumption generated the second highest amount of emissions in the City at approximately 333,300 MT CO<sub>2</sub>e (32% of the total emissions), followed by stationary source emissions, such as cement plants, biomass facilities, and other industrial processes at approximately 82,400 MT CO<sub>2</sub>e (8% of the total emissions). Solid waste emissions contributed approximately 63,700 MT CO<sub>2</sub>e (6% of total emissions). The water and off-road vehicle/recreation sectors comprise the remaining 6% of the emissions inventory.

#### Jurisdictional Inventory

With the removal of the stationary source sector emissions, the community's baseline jurisdictional inventory lowers to 958,570 MT CO<sub>2</sub>e in 2008. As shown in Figure 5.2, transportation generated 52% of total emissions, and energy production and consumption generated 35% of total emissions. The solid waste sector contributed 7%, off-road vehicles/recreation contributed 4%, and water contributed the remaining 2% of total emissions.

Figure 5.1 – 2008 Total Greenhouse Gas Emissions Inventory by Sector

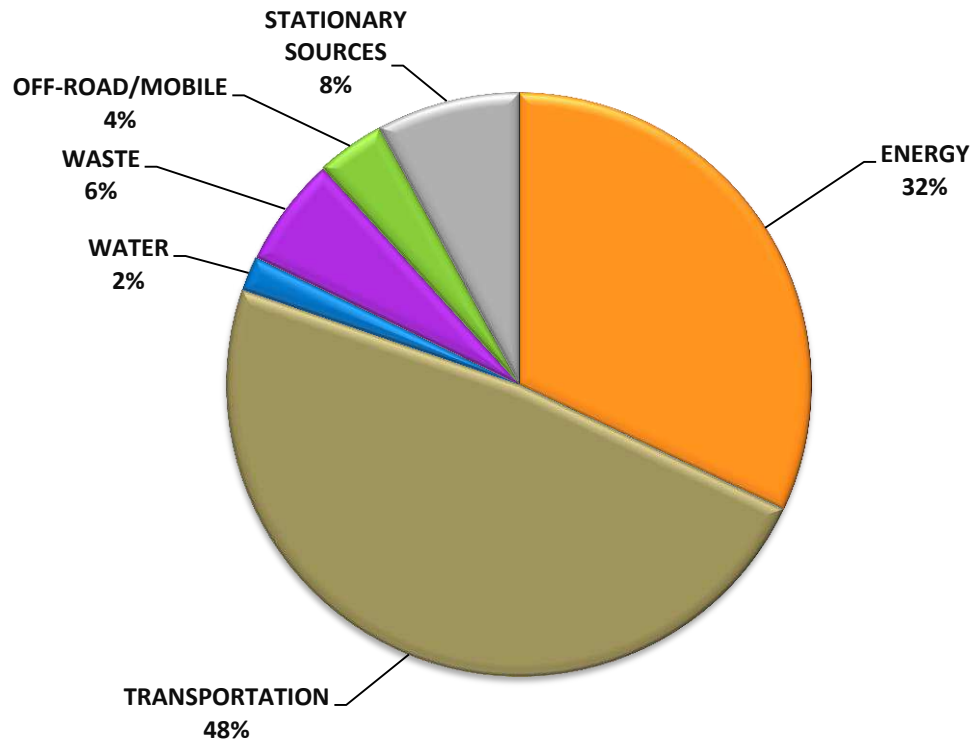
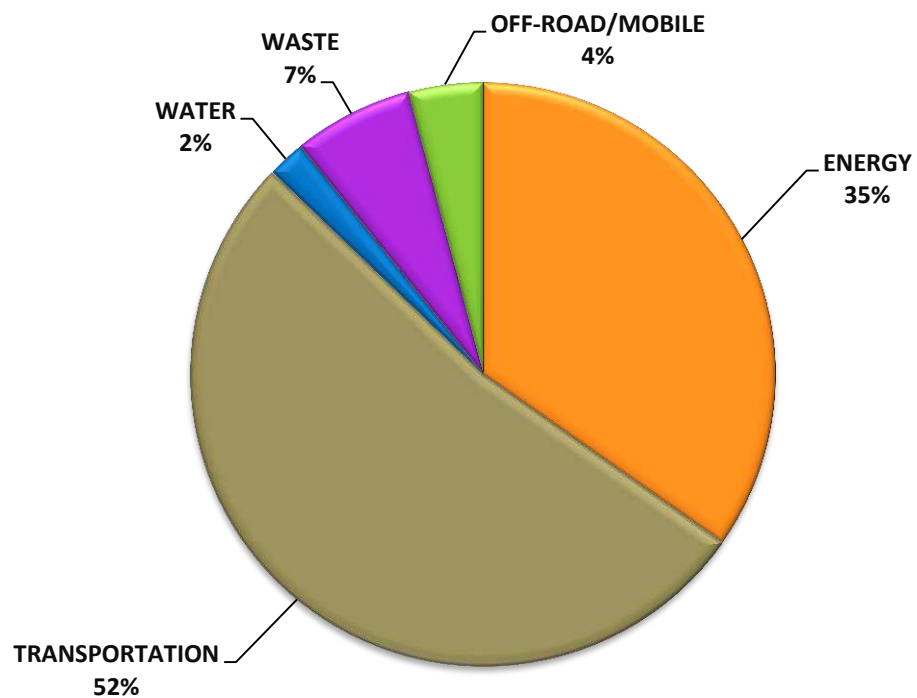


Figure 5.2 – 2008 Jurisdictional Greenhouse Gas Emissions Inventory by Sector



**Table 5.1 – Greenhouse Gas Emissions Inventory and Business-as-Usual Forecast**

| Sector                                     | 2008<br>(MT CO <sub>2</sub> e/yr) | 2020<br>(MT CO <sub>2</sub> e/yr) | % Change<br>from 2008 |
|--|-----------------------------------|-----------------------------------|-----------------------|
| Energy                                     | 333,253                           | 365,273                           | 10%                   |
| Transportation                             | 502,196                           | 614,881                           | 22%                   |
| Solid Waste                                | 63,653                            | 70,179                            | 10%                   |
| Water                                      | 19,944                            | 21,988                            | 10%                   |
| Off-Road and Recreation                    | 39,524                            | 43,575                            | 10%                   |
| Stationary Sources<br>(Non-Jurisdictional) | 82,350                            | 82,350                            | 0%                    |
| <b>TOTAL INVENTORY</b>                     | <b>1,040,919</b>                  | <b>1,198,246</b>                  | <b>15%</b>            |
| <b>JURISDICTIONAL INVENTORY</b>            | <b>958,570</b>                    | <b>1,115,897</b>                  | <b>16%</b>            |

## BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Developing realistic GHG emission forecasts is a critical step in preparing a CAP. Emission forecasts estimate future emissions levels and provide insight regarding the scale of reductions necessary to achieve an emissions target through 2020.

The City's jurisdictional emissions are forecasted to be 1,115,897 MT CO<sub>2</sub>e in 2020, representing growth of 16% from the 2008 baseline emissions. Table 5.1 shows that, while emissions are forecasted to increase in all sectors, transportation-related emissions are anticipated to increase at a greater rate than other sectors.

The forecasts were established using sector-specific growth factors (e.g., energy demand forecasts) or the City's population and employment growth projections. When based on population and employment growth projections, the GHG forecasts assume that baseline year activity intensity (e.g., waste generation per capita) will continue into the future. The business-as-usual GHG forecasts do not include emission reductions associated with State GHG reduction programs or implementation of the local actions described in this CAP.

The forecasts were developed for planning purposes, and represent the best-available estimates. Given the complexity of each emissions sector and the unpredictable nature of market conditions, human behavior and demographics, they will need to be updated in the future as data becomes available. The City will reevaluate the forecasts throughout the CAP implementation process.

## ADJUSTED BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Table 5.2 describes the emission reductions anticipated to occur within the community through implementation of State and federal policies and regulations. The largest anticipated reductions are from State and federal fuel efficiency improvements to passenger vehicles and light-duty trucks. As residents and businesses replace older vehicles with newer ones, people will consume less fuel and generate fewer emissions per vehicle mile traveled. California's low carbon fuel standard will also reduce transportation-related emissions in the community by requiring a transition away from fossil fuels (i.e., gasoline and diesel) toward lower-carbon bio-fuels (e.g., ethanol). Implementation of the regional SB 375 Sustainable Communities Strategy is intended to reduce vehicle emissions through

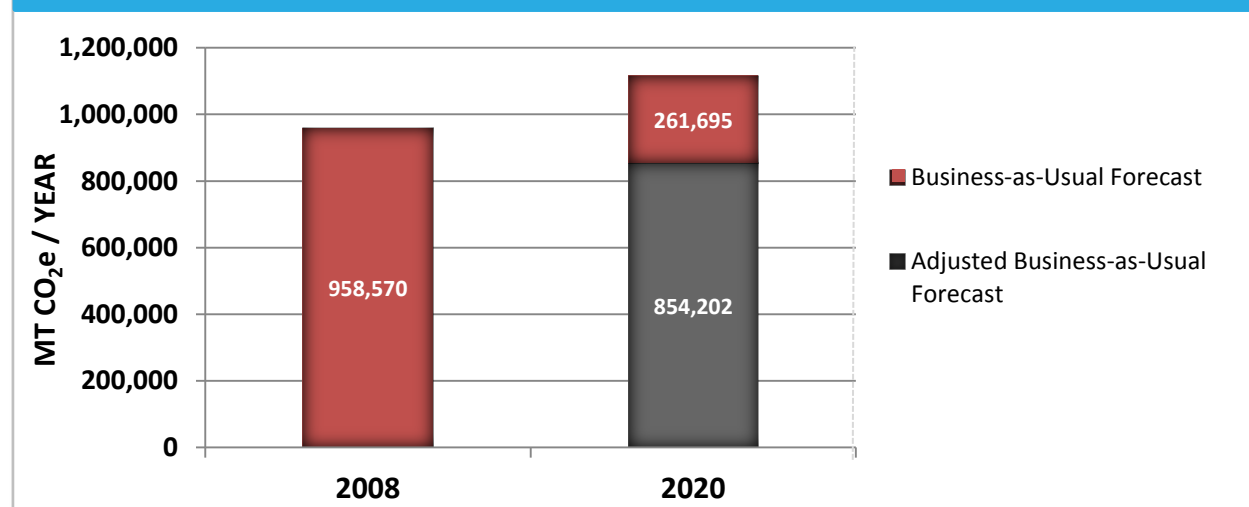
development of effective transit and other alternative transportation systems and encouragement of low-carbon development. California law also requires all utilities to obtain 33% of their electricity from renewable energy sources by 2020. In 2008, about 12% of the Redding Electricity Utility's portfolio was generated from renewable sources. This increase in renewable electricity will reduce the community energy-related emissions. State legislation also established requirements for reducing lighting energy usage in indoor residences and state facilities by no less than 50% by 2018, and a 25% reduction in commercial facilities by the same date. These efficiency improvements will result in emissions reductions associated with reduced electricity consumption. The medium- and heavy-duty vehicle efficiency improvements program and California Energy Code (Title-24) requirements for new construction will create smaller, but still important, communitywide emission reductions.

State and federal actions that reduce Redding's emissions will make it easier for the community to achieve 2020 emission reduction goals. As shown in Table 5.2 and Figure 5.3, with implementation of State and federal actions, communitywide emissions would be 854,202 MT CO<sub>2</sub>e/yr in 2020.

**Table 5.2 – Emission Reductions from State and Federal Actions 2020**

| State or Federal Action  | 2020 Reduction<br>(MT CO <sub>2</sub> e/year) |
|--|---|
| Passenger vehicle and light-duty truck fuel efficiency standards | 68,474  |
| Low Carbon Fuel Standard   | 28,797  |
| Non-Pavley passenger vehicle efficiency programs                 | 14,175  |
| Medium- and heavy-duty vehicle efficiency improvement program    | 3,439   |
| SB 375   | 53,361  |
| 2008 and 2013 California Title-24 standards                      | 2,016   |
| Renewable portfolio standard (33% by 2020)                       | 83,052  |
| Lighting efficiency  | 8,381   |
| <b>Total</b>   | <b>261,695</b>                                |

**FIGURE 5.3 - BUSINESS-AS-USUAL & ADJUSTED BUSINESS-AS-USUAL EMISSION FORECASTS**

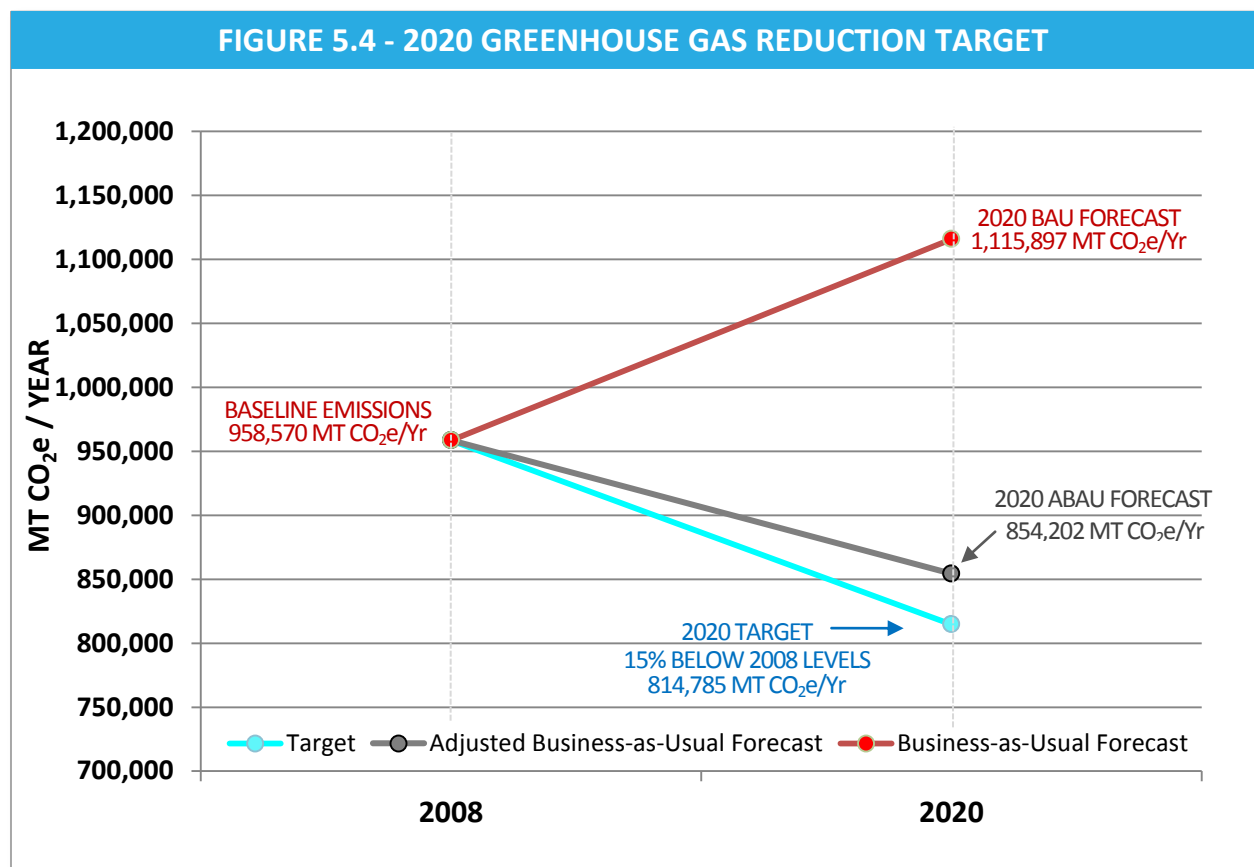


## GREENHOUSE GAS EMISSION REDUCTION TARGETS

The City has selected emission reduction targets that are both ambitious and practical. The targets will allow the City to contribute to State climate protection efforts and are purposely set at levels that are likely to provide CEQA streamlining benefits to new development projects in the community. Redding's GHG reduction target is to reduce community emissions to 15% below 2008 levels by 2020 (814,785 MT CO<sub>2</sub>e/yr).

The California Global Solutions Warming Act (AB 32) requires the State to reduce statewide GHG emissions to 1990 levels by 2020. The City selected its 2020 target in order to contribute the community's fair share to this near-term effort. This target aligns with direction provided by the California Air Resources Board as described in Appendix C.

This CAP describes measures that can achieve the 2020 reduction target. While the City supports the goal of Executive Order S-03-05, it recognizes that estimating 2050 emission levels and reduction potentials are highly speculative. For this reason, the City has chosen not to focus on any reduction targets beyond 2020 at this time. The City will re-evaluate its long-term GHG reduction efforts to reflect future conditions and adjust emission reduction measures as necessary.



## GREENHOUSE GAS EMISSION REDUCTION MEASURES

To meet its adopted emissions reduction targets, the City will implement policies, programs, and other projects related to energy, waste, and transportation. This section provides a summary of the CAP's overall emissions reduction potential and describes the measures that the City will use to implement the local actions.

### SUMMARY OF REDUCTIONS

Table 5.3 describes the emissions reduction potential of the City's adopted CAP measures. In 2020, local actions are anticipated to reduce approximately 44,551 MT CO<sub>2</sub>e/yr. The waste-related measures are expected to provide the largest portion, 95.0%, of the local reductions. Building energy measures provide 4.7% of reductions, and transportation measures provide the remaining 0.3%. Table 5.4 and Figure 5.5 illustrate that together the local and state actions are expected to reduce communitywide emissions to approximately 15.5% below 2008 baseline emissions levels, surpassing the adopted 2020 target (15% below 2008 levels) by 5,134 MT CO<sub>2</sub>e/yr. This estimated level of reduction conforms to the CEQA requirements for a qualified GHG reduction strategy and can be expected to provide streamlining benefits for compliant projects constructed within the jurisdiction prior to 2020.

**Table 5.3 – Quantified Greenhouse Gas Reductions**

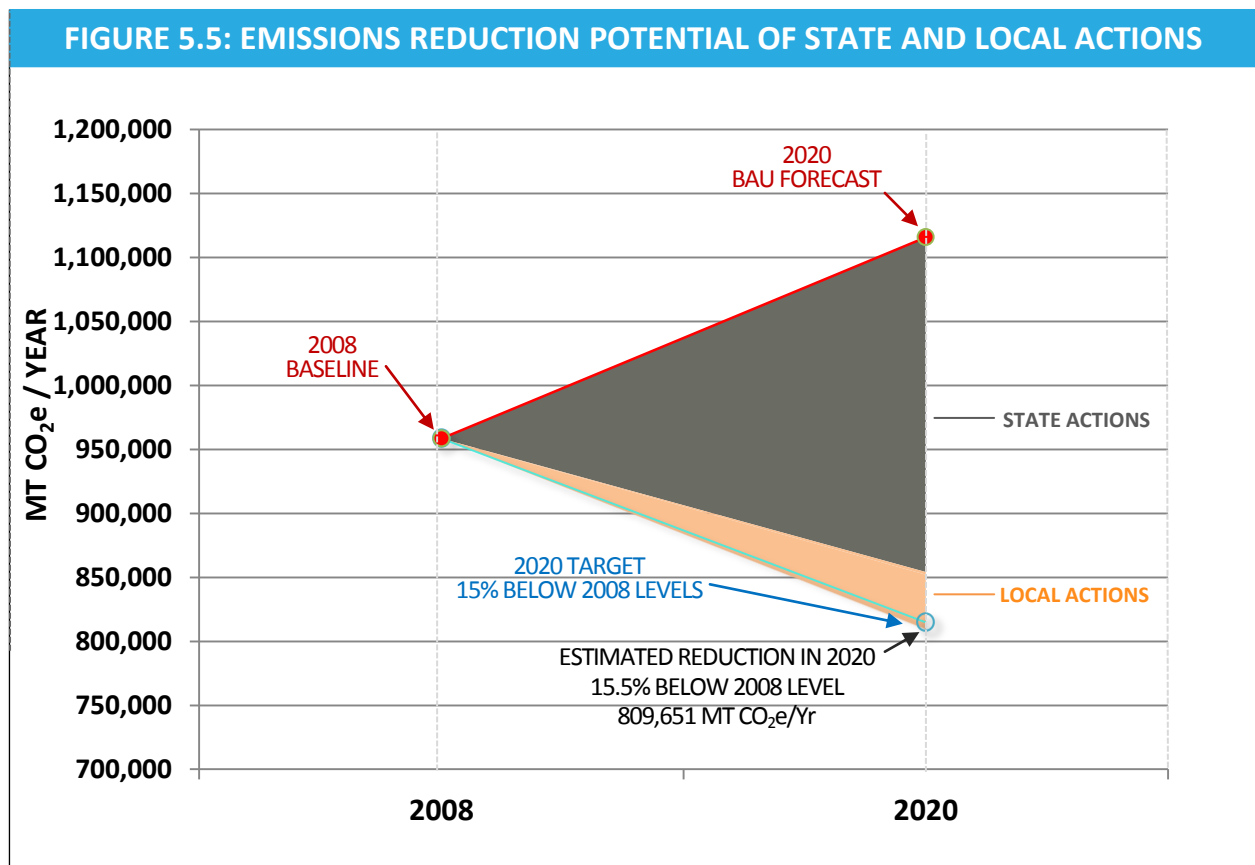
| Sectors and Measures                 |                                    | 2020<br>(MT CO <sub>2</sub> e/yr) |
|--------------------------------------|------------------------------------|-----------------------------------|
| <b>Building Energy</b>               |                                    |                                   |
| BE-1                                 | Energy Efficiency Retrofits        | 130                               |
| BE-2                                 | New Construction                   | -                                 |
| BE-3                                 | Smart Grid Integration             | 67                                |
| BE-4                                 | Solar Photovoltaic Systems         | 1,794                             |
| BE-5                                 | Building Shade Trees               | 92                                |
| <b>Subtotal</b>                      |                                    | <b>2,083</b>                      |
| <b>Solid Waste</b>                   |                                    |                                   |
| SW-1                                 | Methane Recovery                   | 42,341                            |
| <b>Subtotal</b>                      |                                    | <b>42,341</b>                     |
| <b>Transportation</b>                |                                    |                                   |
| T-1                                  | Mixed Use Development              | -                                 |
| T-2                                  | Bicycle Infrastructure             | -                                 |
| T-3                                  | Pedestrian Network                 | -                                 |
| T-4                                  | Service and Maintenance Efficiency | 127                               |
| <b>Subtotal</b>                      |                                    | <b>127</b>                        |
| <b>TOTAL LOCAL ACTION REDUCTIONS</b> |                                    | <b>44,551</b>                     |



**Table 5.4 – Reduction Potential of the City’s CAP Measures**

|   | 2008     | 2020                          |                      |                           |
|---|----------|-------------------------------|----------------------|---------------------------|
|   | Baseline | BAU                           | ABAU                 | ABAU + Local CAP Measures |
| <b>GHG Emissions</b><br>(MT CO <sub>2</sub> e/Yr) | 958,570  | 1,115,897                     | 854,202              | 809,651                   |
| <b>Change from Baseline</b>                       | NA       | 16%                           | -10.9%               | -15.5%                    |
| <b>CAP GHG Reduction Targets</b>                  | NA       | Target = 15% below 2008 level | Does Not Meet Target | Meets Target              |

Figure 5.5 demonstrates the relative contribution of State and the City’s local actions. While the State actions provide the majority of reductions in 2020, the local actions are necessary to achieve the target.





## REDUCTION MEASURES

The CAP measures define the programs, policies, and projects that the City will undertake to accomplish its emission reduction objectives. Within this section, the measures are organized into three categories including: energy, waste, and transportation. Each category begins with an introduction followed by the pages that describe the component measures.

### Measure Structure

To aid the reader and to facilitate implementation of the CAP, each measure contains the following information:

- **Emission Reductions** - Reduction potential values are provided after each measure title, and identify the estimated annual emission reductions anticipated in 2020 in MT CO<sub>2</sub>e/yr. All measures have a quantifiable GHG reduction potential.
- **Description** - Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide guidance that will be used in program implementation or highlight the City's actions to date that relate to a particular measure.
- **Actions and Progress Indicators** - Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the City will take to implement the measure. The table also identifies responsible departments. Progress indicators enable staff, the City Council, and the public to evaluate implementation and monitor overall CAP progress.

### ENERGY MEASURES:

The use of electricity and natural gas within residential, commercial, and industrial buildings generated over 35% of Redding's communitywide GHG emissions in 2008. The energy measures described on the following pages recommend ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase the use of renewable energy.



## Measure BE-1: Energy Efficiency Retrofits

**2020 GHG Reduction Potential: 130 MT CO<sub>2</sub>e/yr**

Fifty percent of homes in Redding were built before the State of California adopted the Title 24 energy efficiency requirements in 1980. Energy efficiency retrofits help residents reduce their utility bills and the community's building-related emissions. Energy audits can identify inefficient heating and cooling systems and gaps in the building's envelope through which heat escape or enter. Audits can also help homeowners and building owners prioritize cost-effective retrofit investments to maximize their financial returns.

Redding Electric Utility (REU) provides various programs aimed at encouraging customers to make energy-efficient improvements to existing buildings. REU's Home Performance Program (HPP) is an incentive-based program for homeowners to improve their home's energy performance. HPP projects must incorporate REU-approved installation measures and standards that include: removal of old

heating ventilation and air conditioning (HVAC) systems, right-sizing and designing new HVAC and duct systems to REU's high standards, adding proper attic insulation, and providing whole-house ventilation systems. REU also offers free home energy audits to its residential customers to help save energy and money. REU's energy auditors provide customers with low- to no-cost energy saving tips. REU's Weatherization Program offers rebates for the installation of qualifying insulation, windows screens and tints, radiant barrier materials, and electric water heater blankets/wraps. Through its HVAC Program, REU provides rebates for HVAC duct repair and cleaning and the installation of swamp coolers, whole-house fans, and attic fans. REU also offers custom incentives to commercial customers with existing buildings who integrate energy demand saving/shifting technologies, equipment, measures and products.

REU will continue to develop and fund energy-efficiency programs that result in energy conservation, with a focus on peak-load reductions.

| ACTION              |   | RESPONSIBILITY           |
|---------------------|---|--------------------------|
| <b>Short-Term</b>   |   |                          |
| <b>A</b>            | Continue to promote and improve utility incentives for energy conservation programs for existing homes and buildings. | Redding Electric Utility |
| PROGRESS INDICATORS |   | YEAR                     |
| <b>1</b>            | Contractors embrace program; customers move forward with projects.  | 2020                     |
| <b>2</b>            | Large commercial customers implement custom energy and demand savings projects.                                       | 2020                     |



## Measure BE-2: New Construction

**2020 GHG Reduction Potential:** Included in Title-24 State Reductions

The 2010 CalGreen Building Code (CalGreen) sets guidance for higher building performance standards. CalGreen offers two voluntary compliance pathways to achieve 15% and 30% energy efficiency above the State's 2008 Title 24 Energy Code efficiency requirements. Contingent upon funding availability, the City will offer priority permitting to new residential projects that demonstrate 15% higher energy efficiency than Title 24 requirements. These efforts will serve to increase energy efficiency of new residential buildings and would help to lower homeowners utility bills.

Additional energy savings are anticipated to be created through the 2013 update of the State's Title 24 standards. All new construction for which permit applications have been submitted between 2011 and 2013 has been, or will be, required to meet the 2008 Title-24 requirements. All new construction developed between 2014 and 2020 will be required to comply with the updated 2013 Title 24 requirements that the California Energy Commission estimates will be 20-25% more energy efficient than the 2008 standards. The City anticipates that all new construction in the City will be subject to the 2013 Title 24 standards or higher after January 2014. The City's CAP includes reductions associated with the 2008 and 2013 Title 24 standards with the statewide reductions (see appendix B for details). Further increases in Title 24 standards are anticipated after 2016 but are too speculative at this point in time to quantify.

Because the State develops the Title 24 standards for each code period with the goal of balancing energy efficiency and cost-effectiveness, the City believes it is not prudent to require efficiency at a level higher than the State's standard. The City will not adopt an efficiency standard more stringent than the State's code.

REU offers custom incentives to owners of new commercial building projects who integrate demand saving/shifting technologies, equipment, measures, and products into the building design. REU will also explore offering its Home Performance Program to new residential construction projects.

| ACTION              |  | RESPONSIBILITY           |
|---------------------|--|--------------------------|
| <b>Short-Term</b>   |  |                          |
| <b>A</b>            | Continue to offer incentives to commercial customers that install energy demand saving/shifting technology.  | Redding Electric Utility |
| <b>B</b>            | Consider expanding Home Performance Program to new residential construction.                                 | Redding Electric Utility |
| PROGRESS INDICATORS |  | YEAR                     |
| <b>1</b>            | All new construction to achieve 25% reduction in energy use above 2008 Title 24 energy efficiency standards. | 2020                     |



## Measure BE-3: Energy Management Systems

**2020 GHG Reduction Potential:** 67 MT CO<sub>2</sub>e/yr

REU is currently implementing a voluntary web-based electric load profiling tool to help commercial and industrial customers better manage their energy and demand uses. REU is also incorporating thermal energy storage (TES) systems. These systems are peak-shifting units that work with air conditioners. Each unit is simply a tank containing water that is frozen during off-peak hours; the ice is then used to provide cooling during peak hours. By connecting to such a unit, the air conditioning unit's compressor can be turned off for several hours without any loss of cooling to the building. REU has been partnering with local business and building owners to install TES systems throughout the Redding community. The program is designed to provide commercial building owners with both the TES system and installation incentives. REU has installed 33 units and is investigating the potential for more unit installations in the future pending available funding.

| ACTION              |   | RESPONSIBILITY           |
|---------------------|---|--------------------------|
| <b>Short-Term</b>   |   |                          |
| <b>A</b>            | Continue to encourage web-based electric load profiling tool and TES system installation. | Redding Electric Utility |
| PROGRESS INDICATORS |   | YEAR                     |
| <b>1</b>            | TES systems continue to be installed.   | 2020                     |



## Measure BE-4: Solar Photovoltaic Systems

**2020 GHG Reduction Potential:** 1,794 MT CO<sub>2</sub>e/yr

Redding is a good candidate for solar technologies based on its relatively high solar insolation level. Installation of residential solar photovoltaic (PV) systems allows homeowners to take advantage of cost-saving renewable energy. In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for larger PV systems. Parking lots also provide excellent opportunities for additional solar energy generation.

Numerous barriers may prevent widespread adoption of solar PV technology including City regulations and initial up-front costs. The City will review its regulations, ordinances, and codes to identify any barriers to solar project installation. To assist residents and businesses in overcoming the financial burdens associated with PV installation, REU began implementing a solar program pursuant to Senate Bill (SB) 1 in 2007, which seeks to encourage the installation of 3,000 megawatts of solar PV energy statewide by December 31, 2016. REU will continue to promote solar PV and work with customers that are interested in installing solar PV on their homes or businesses.

| ACTION              |  | RESPONSIBILITY                  |
|---------------------|--|---------------------------------|
| <b>Short-Term</b>   |  |                                 |
| <b>A</b>            | Review City regulations, ordinances, and codes to identify and remove, when appropriate, any barriers to solar PV system installation. | Development Services Department |
| <b>B</b>            | Continue to encourage customers to install solar PV systems.   | Redding Electric Utility        |
| PROGRESS INDICATORS |  | YEAR                            |
| <b>1</b>            | Solar PV systems continue to be installed.   | 2020                            |



## Measure BE-5: Building Shade Trees

**2020 GHG Reduction Potential:** 92 MT CO<sub>2</sub>e/yr

Properly located trees can provide shading for residential and commercial buildings, and thereby reduce the need for air conditioning. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Large, deciduous species are ideal for reducing building energy use as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow. The City currently requires planting one tree for each 500 square feet of residential building area.

| ACTION              |  | RESPONSIBILITY    |
|---------------------|--|-------------------|
| <b>Short-Term</b>   |  |                   |
| A                   | Continue existing tree planting requirements | Planning Division |
| PROGRESS INDICATORS |  | YEAR              |
| 1                   | 3,800 shade trees are planted.               | 2020              |

## WASTE MEASURES:

The decomposition of the community's solid waste in landfills generated approximately 7% of Redding's communitywide GHG emissions in 2008. The waste-related measures described on the following pages recommend ways to increase diversion of organic wastes and describe the County's implementation of enhanced landfill methane capture systems.



## Measure SW-1: Methane Recovery

**2020 GHG Reduction Potential:** 42,341 MT CO<sub>2</sub>e/yr

The Air Resources Board approved a regulation to reduce methane emissions from municipal solid waste landfills as an early implementing action of AB 32. Per the regulation, methane capture facilities have been required at all municipal solid waste landfills since June 2010. Two landfills are used in Shasta County to dispose of waste from Redding residents: the West Central Landfill and the Anderson Landfill. The West Central Landfill is currently an uncontrolled municipal solid waste landfill, meaning there is no methane capture infrastructure in place. However, the County is in the process of constructing a gas control system that would capture landfill-generated methane and direct it to a flare where it would be burned off, dramatically reducing the global warming potential of the gas. In the future, this system may be upgraded to a landfill gas-to-energy system under which an operator could construct a power plant to capture the landfill methane and burn it to generate electricity. The Anderson Landfill currently has a methane capture system in place with no plans for system upgrades.

Although Shasta County will complete installation of the methane capture facility at the West Central Landfill, the project will result in emissions reductions associated with the solid waste generated in the City of Redding sent to the landfill and can therefore be counted towards the City's reduction target.

| ACTION              |  | RESPONSIBILITY              |
|---------------------|--|-----------------------------|
| <b>Short-Term</b>   |  |                             |
| A                   | Consult with County staff to verify the installed methane capture system at the West central Landfill achieves the estimated 75% control efficiency. | Support Services Department |
| PROGRESS INDICATORS |  | YEAR                        |
| 1                   | Methane recovery efficiency at West Central Landfill improved from 0% to 75%   | 2020                        |

## TRANSPORTATION/LAND USE MEASURES:

The use of motor vehicles for transporting people and products generated approximately 52% of Redding's communitywide GHG emissions in 2008. The transportation-related measures described on the following pages describe the City's efforts to reduce auto-dependence in new development and improve biking and walking infrastructure within the community.



## Measure T-1: Mixed Use Development

**2020 GHG Reduction Potential:** Included in SB 375 State Reductions

Research demonstrates that average daily shopping and errand trips in well serviced neighborhoods are less than half the distance than in neighborhoods with low levels of diversity. This research also indicates that residents who live within a ¼- to ½-mile of neighborhood commercial centers are more likely to walk or bike in order to purchase daily goods and services. Enhancing the quality and diversity of uses in the City's neighborhood commercial centers will help decrease transportation-related GHG emissions and improve residents' quality of life.

The City will provide incentives to locate higher density development near transit routes and other designated locations. The City has taken the following measures to encourage mixed-use development:

- Allows unlimited residential density in the Downtown core (Central Business District)
- Does not limit building height in Downtown core
- Does not require offstreet parking in the Downtown core
- Identifies two mixed use neighborhoods in the General Plan with underlying single family district classifications; new mixed use developments may provide a mix of residential projects and construct up to 100,000 square feet of commercial floor area without going through the General Plan Amendment process.

| ACTION              |  | RESPONSIBILITY    |
|---------------------|--|-------------------|
| <b>Short-Term</b>   |  |                   |
| <b>A</b>            | Create streamlined permitting process for higher density and mixed-use developments.   | Planning Division |
| <b>B</b>            | Coordinate bicycle and pedestrian infrastructure improvements with planning for mixed-use, transit-oriented developments to ensure infrastructure improvements target higher density areas first to maximize trip reduction benefits | Planning Division |
| PROGRESS INDICATORS |  | YEAR              |
| <b>1</b>            | 5% of all new residential units are constructed in mixed-use development.  | 2020              |



## Measure T-2: Bicycle Infrastructure

### 2020 GHG Reduction Potential: Included in SB 375 State Reductions

The City understands the importance of creating a balanced multi-modal transportation network that meets the needs of all users, such as pedestrians, bicyclists, motorists, movers of commercial goods, and users of public transportation. Redding's bicycle network currently provides:

- 20.6 miles of paved multi-use paths
- 2.0 miles of Class I paths
- 24.6 miles of Class II lanes, and
- 77.0 miles of Class III routes

The City has adopted the 2010-2015 Bikeway Action Plan, which identifies and prioritizes necessary bicycle system improvements to increase bicycle use for commuting and recreation. The plan calls for the construction of 38.7 miles of new on-street bicycle paths/lanes, and the conversion of 57.7 miles of existing Class III bicycle routes to Class II bicycle paths. The City is rapidly implementing these goals already and is planning for additional expansions beyond this target in the near future. In addition to bicycle paths and lanes, the City also participates in a program to provide public bicycle racks on streets in the Downtown core, and currently requires bicycle facilities in commercial developments to encourage a shift towards bicycle use for daily trips.

| ACTION              |   | RESPONSIBILITY                                    |
|---------------------|---|---|
| <b>Short-Term</b>   |   |   |
| <b>A</b>            | Continue to pursue grant funding opportunities to implement the Bikeway Action Plan.  | Community Services;<br>Public Works<br>Department |
| <b>Medium-Term</b>  |   |   |
| <b>B</b>            | Update Bikeway Action Plan to increase bicycle infrastructure expansion goals, with a focus on connecting activity centers (e.g., school campuses, shopping areas, job centers) with residential neighborhoods. | Community Services                                |
| PROGRESS INDICATORS |   | YEAR  |
| <b>1</b>            | 96.4 new miles of Class I and II bicycles lanes constructed.  | 2020  |



## Measure T-4: Service and Maintenance Efficiency

**2020 GHG Reduction Potential:** 127 MT CO<sub>2</sub>e/yr

REU is using new and existing technologies to reduce VMT associated with its service call and maintenance operations, including:

- exploring the potential for leveraging REU's GIS mapping system to minimize service call mileage, and
- implement substation modernization by installing microwave radios that will provide data from substations and other major assets to engineers and maintenance personnel to reduce vehicle trips to the field.

| ACTION              |  | RESPONSIBILITY           |
|---------------------|--|--------------------------|
| <b>Short-Term</b>   |  |                          |
| <b>A</b>            | Use GIS mapping to reduce VMT associated with service calls.   | Redding Electric Utility |
| <b>B</b>            | Implement substation modernization such as through the installation of microwave radios to reduce maintenance service VMT. | Redding Electric Utility |
| PROGRESS INDICATORS |  | YEAR                     |
| <b>1</b>            | Reduce service call and maintenance VMT annually.  | 2020                     |

## IMPLEMENTATION AND MONITORING

This section describes how the City will implement the emission reduction measures and actions contained in the CAP. The section contains the following three subsections:

- **Measure Implementation** - Describes how City staff will implement CAP measures and their related actions, and the role of the progress indicators and other guidance provided within the measure tables.
- **Program Evaluation and Evolution** - Discusses the need to evaluate, update, and amend the CAP over time, in order to ensure that the program remains effective and current.
- **Relationship to the California Environmental Quality Act** - Describes the relationship between the CAP and the California Environmental Quality Act (CEQA), and establishes criteria for City staff to use when determining if a proposed project is consistent with the document.

### MEASURE IMPLEMENTATION

Ensuring that the measures translate from policy language into on-the-ground results is critical to the success of the CAP. To facilitate this, each measure contains a table that identifies the specific actions the City will carry out. The table also identifies responsible departments for each action. The second section of each table provides progress indicators that enable City staff, the City Council, and the public to track measure implementation and monitor overall CAP progress.



Upon adoption of the CAP, the City departments identified will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this action implementation. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships will need to be established. The City would also need to assess its progress towards measure implementation.

## PROGRAM EVALUATION AND EVOLUTION

The CAP represents the City's best initial attempt to create an organized, communitywide response to the threat of climate change at the time of preparation. Staff will need to evaluate the program's performance over time and be ready to alter or amend the plan if it is not achieving the reduction targets.

### Program Evaluation

Two types of performance evaluation are important: (A) evaluation of the community's overall ability to reduce GHG emissions as a whole and (B) evaluation of the performance of individual CAP measures. Communitywide emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the City versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2008 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction targets. The City will coordinate inventories in 2015 and 2020 to assess the level of GHG reduction goal attainment.

A progress report on the CAP action items will be provided to decision-makers on a semi-annual basis. The progress report will include a brief assessment on the progress and implementation of individual CAP measures, including how new projects have been incorporating relevant measures. The progress report will allow for gaps and new opportunities to be identified. It also will allow for additional measures to be added to the CAP.

### Program Evolution

To remain relevant, the City must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and State and federal legislation will change. As part of the evaluations identified above, the City will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

## RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA Guidelines, Section 15183.5 describes the requirements for an emissions reduction plan to be able to provide tiering and streamlining benefits to future development projects. Section 15183.5(b)(1)(D) specifically states that the plan must contain measures, that if implemented on a project-by-project basis, would collectively achieve the plan's established emissions reduction target. This guidance essentially means that each future project seeking to use CEQA tiering will need to demonstrate compliance with the CAP.

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## **Appendix A –**

# **GHG Emissions Inventory and Forecasts Methodology**

## GHG INVENTORY AND FORECASTS

This appendix describes the process of calculating baseline greenhouse gas (GHG) emissions and their future forecasts for the Shasta Regional Climate Action Plan (RCAP).

### The GHG Inventory and Forecasting Process

The purpose of GHG baseline inventory is to provide a snapshot of communitywide GHG emissions in a given year. Baseline emissions for 2008 were developed for Redding, Anderson, Shasta Lake and the unincorporated County separately. Countywide emissions were then calculated based on the sum of total emissions for each of the jurisdictions. The following sectors were quantified within this analysis.

- Energy consumption – GHG emissions from electricity production, and natural gas and propane combustion.
- Transportation – GHG emissions from vehicles traveling on highways and roads within the County, adjusted to deduct pass-through-trips (i.e. trips that did not start or finish within the County).
- Solid waste – GHG emissions related to current and past waste disposal at the landfills in the county.
- Water consumption – GHG emissions from pumping, treating and conveyance of portable water for residential and non-residential uses.
- Wastewater treatment – GHG emissions from secondary treatment of wastewater.
- Off-road vehicles and equipment – GHG emissions from vehicles and equipment used off-road such as light commercial equipment, lawn and garden equipment, construction and mining, and pick-up trucks.
- Recreation – GHG emissions from vehicles used for recreational purpose such as boats, watercrafts, and terrain vehicles.
- Agriculture - GHG emissions from agricultural operations (e.g., field equipment, irrigation pumps, livestock, soil amendments, pesticide application, rice straw decomposition).
- Forestry- GHG emissions from timberland management and logging operations.
- Stationary Sources – (e.g., cement plants, co-gen facilities, timber industries).

The purpose of GHG emission forecasts is to estimate future emission levels and provide insight regarding the scale of reductions necessary to achieve an emissions target. GHG emission forecasts were prepared for the County and the individual jurisdictions for 2020, 2035 and 2050, assuming that historic trends of energy and water consumption, waste generation, and land use and transportation pattern will remain similar in future with population growth. These business-as-usual scenario projections demonstrate emissions growth in the individual jurisdictions (Redding, Anderson and Shasta Lake and the unincorporated County) in the short-, mid- and long-term. The business-as-usual scenario does not include the emission reductions potential of State legislative and regulatory actions or the proposed emission reduction measures recommended in the RCAP.

### Total versus Jurisdictional Emissions Inventories

With this document the *total* emissions inventory refers to all emissions that result from community (e.g., residential, business, municipal) activities. Certain types of these emissions cannot be controlled by a jurisdiction due to a lack of local authority over the generating activity. The *jurisdictional* inventory refers to

only those emissions that a jurisdiction has authority to influence. Per direction from the Shasta County Air District (District), AECOM removed the stationary source, forestry, and agriculture sectors from the jurisdictional inventories and they are not considered for emissions forecasts and reduction target setting. The County and the individual jurisdictions will rely on State mandates to regulate stationary sources (e.g., cement plants, lumber mills, biomass generation facilities). Already a number of state-directed programs are monitoring emissions and reduction strategies for large stationary source emitters. Similarly, emissions related to forestry have been removed from the GHG inventories since forestry activities are regulated directly by the State. Emissions related to agriculture were also removed from the inventory due to the fact that neither the County nor the District regulates agricultural activities.

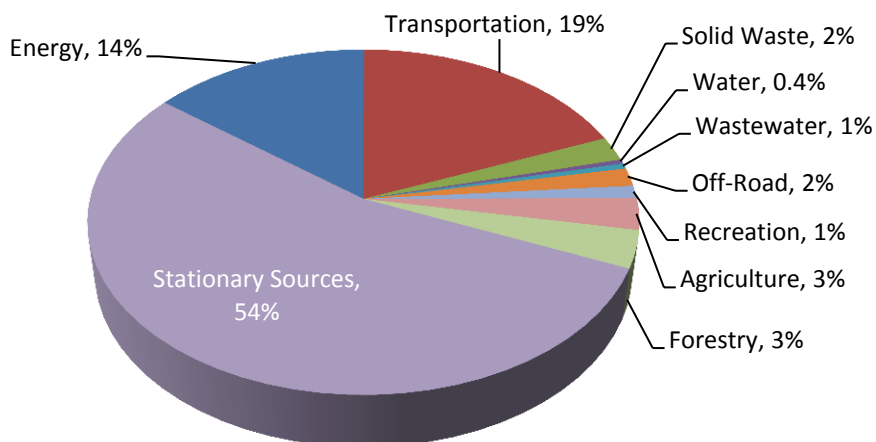
It should be noted that total emissions (including the agriculture, forestry, and stationary sources sectors) are only discussed in the baseline inventories. The agriculture, forestry, and stationary sources sectors are not carried forward in the emissions projections, nor are they addressed within the target-setting and measure development portions of the RCAP.

## Shasta Countywide Emissions

### ► 2008 Baseline GHG Emissions Inventory

The countywide GHG baseline emissions are the sum of individual city and unincorporated County emissions. In 2008, Shasta County jurisdictions generated a total of 4,476,587 metric tons of carbon dioxide equivalent emissions (MT CO<sub>2</sub>e). As shown in Figure 1 and Table 1, stationary sources were the highest source of emissions countywide contributing approximately 54% of the total emissions. Transportation emissions were the second highest source of emissions at 19% of the total emissions, followed by energy-related emissions at 14% of the total emissions. When agriculture, forestry, and stationary source emissions are removed, the 2008 countywide jurisdictional inventory is reduced to 1,762,400 MT CO<sub>2</sub>e. In the jurisdictional inventory, transportation emissions contribute 48% of total emissions and energy-related emissions make up 37% of total emissions.

**Figure 1: 2008 Countywide Total GHG Emissions Inventory**

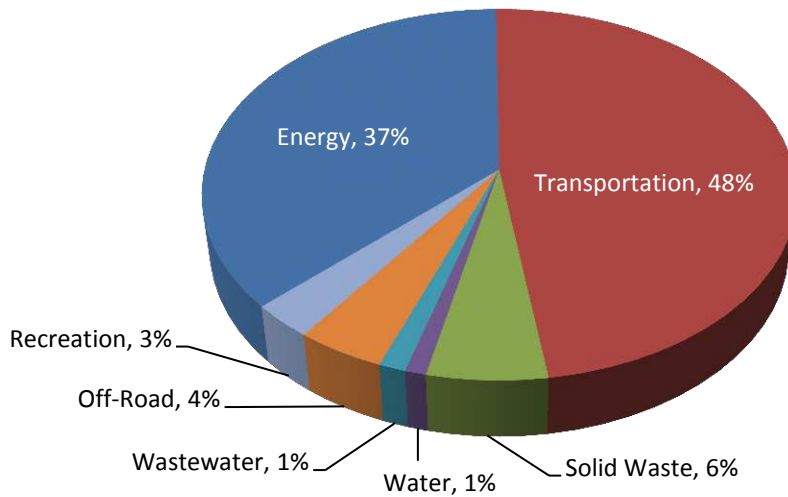


**Table 1: Countywide 2008 Baseline GHG Inventory (Total and Jurisdictional)**

| Emissions Sector                | Total                 |             | Jurisdictional        |             |
|---------------------------------|-----------------------|-------------|-----------------------|-------------|
|                                 | MT CO <sub>2</sub> -e | %           | MT CO <sub>2</sub> -e | %           |
| Energy Consumption              | 647,618               | 14%         | 647,618               | 37%         |
| Transportation                  | 843,649               | 19%         | 843,649               | 48%         |
| Solid Waste                     | 102,083               | 2%          | 102,083               | 6%          |
| Water Consumption               | 17,817                | 0.4%        | 17,817                | 1%          |
| Wastewater Treatment            | 22,898                | 1%          | 22,898                | 1%          |
| Off-Road Vehicles and Equipment | 75,330                | 2%          | 75,330                | 4%          |
| Recreation                      | 53,005                | 1%          | 53,005                | 3%          |
| Agriculture                     | 132,234               | 3%          |                       |             |
| Forestry                        | 156,538               | 3%          |                       |             |
| Stationary Sources              | 2,425,415             | 54%         |                       |             |
| <b>Total</b>                    | <b>4,476,587</b>      | <b>100%</b> | <b>1,762,400</b>      | <b>100%</b> |

*Note: The GHG emissions for agriculture, forestry, and stationary sources related activities have only been reported in the inventory, and will not be considered for emissions projection, target-setting and measure development in the RCAP.*

**Figure 2: 2008 Countywide Jurisdictional GHG Emissions Inventory**



**Jurisdictional Emission Forecasts**

The countywide jurisdictional GHG emissions are projected to be 2,008,921 MT CO<sub>2</sub>e in 2020, 2,411,347 MT CO<sub>2</sub>e in 2035, and 2,843,100 MT CO<sub>2</sub>e in 2050 which correspond to 14%, 37%, 61% growth in emissions in the short-, mid- and long-term respectively from the 2008 baseline emissions. The chart below demonstrates that, transportation sector are expected remain the highest source of emissions countywide. Under business-as-usual scenario, transportation emissions show a growth of 19% by 2020, 46% by 2035, and 74% by 2050 from the 2008 level. Energy-related emissions are projected to increase in the short-, mid- and long-term in line with the utilities' energy demand forecasts.

**Table 2: Shasta Countywide GHG Emissions Forecasts (Total and Jurisdictional)**

| <b>Total Shasta Countywide Emissions Forecasts</b> |                  |             |                  |             |                  |             |                  |             |
|--|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
|  | <b>2008</b>      |             | <b>2020</b>      |             | <b>2035</b>      |             | <b>2050</b>      |             |
| <b>Emissions Sector</b>                            | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    |
| Energy Consumption                                 | 647,618          | 14%         | 709,844          | 15%         | 842,476          | 16%         | 995,450          | 18%         |
| Transportation                                     | 843,649          | 19%         | 1,003,335        | 21%         | 1,232,219        | 24%         | 1,469,928        | 26%         |
| Solid Waste  | 102,083          | 2%          | 111,748          | 2%          | 126,852          | 2%          | 142,344          | 3%          |
| Water Consumption                                  | 17,817           | 0%          | 19,443           | 0%          | 22,146           | 0%          | 24,848           | 0%          |
| Wastewater Treatment                               | 22,898           | 1%          | 25,100           | 1%          | 28,408           | 1%          | 31,875           | 1%          |
| Off-Road Vehicles and Equipment                    | 75,330           | 2%          | 82,275           | 2%          | 93,559           | 2%          | 104,976          | 2%          |
| Recreation   | 53,005           | 1%          | 57,175           | 1%          | 65,688           | 1%          | 73,680           | 1%          |
| Agriculture  | 132,234          | 3%          | 132,234          | 3%          | 132,234          | 3%          | 132,234          | 2%          |
| Forestry   | 156,538          | 3%          | 156,538          | 3%          | 156,538          | 3%          | 156,538          | 3%          |
| Stationary Sources                                 | 2,425,415        | 54%         | 2,425,415        | 51%         | 2,425,415        | 47%         | 2,425,415        | 44%         |
| <b>Total</b>                                       | <b>4,476,587</b> | <b>100%</b> | <b>4,723,107</b> | <b>100%</b> | <b>5,125,534</b> | <b>100%</b> | <b>5,557,287</b> | <b>100%</b> |

| <b>Jurisdictional Shasta Countywide Emissions Forecasts</b> |                  |             |                  |             |                  |             |                  |             |
|---|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
|   | <b>2008</b>      |             | <b>2020</b>      |             | <b>2035</b>      |             | <b>2050</b>      |             |
| <b>Emissions Sector</b>                                     | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    |
| Energy Consumption  | 647,618          | 37%         | 709,844          | 35%         | 842,476          | 35%         | 995,450          | 35%         |
| Transportation  | 843,649          | 48%         | 1,003,335        | 50%         | 1,232,219        | 51%         | 1,469,928        | 52%         |
| Solid Waste   | 102,083          | 6%          | 111,748          | 6%          | 126,852          | 5%          | 142,344          | 5%          |
| Water Consumption   | 17,817           | 1%          | 19,443           | 1%          | 22,146           | 1%          | 24,848           | 1%          |
| Wastewater Treatment  | 22,898           | 1%          | 25,100           | 1%          | 28,408           | 1%          | 31,875           | 1%          |
| Off-Road Vehicles and Equipment                             | 75,330           | 4%          | 82,275           | 4%          | 93,559           | 4%          | 104,976          | 4%          |
| Recreation  | 53,005           | 3%          | 57,175           | 3%          | 65,688           | 3%          | 73,680           | 3%          |
| <b>Total</b>  | <b>1,762,400</b> | <b>100%</b> | <b>2,008,920</b> | <b>100%</b> | <b>2,411,348</b> | <b>100%</b> | <b>2,843,101</b> | <b>100%</b> |

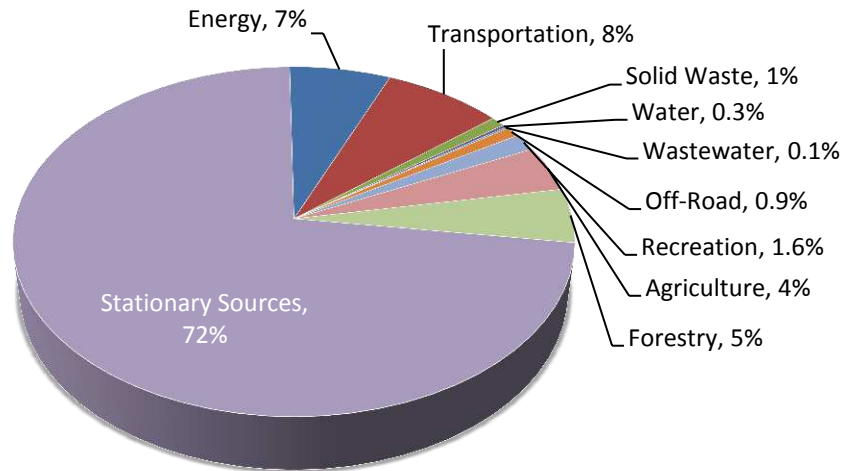


## Unincorporated Shasta County Emissions

### ► GHG Emissions Inventory

In 2008, the unincorporated areas of Shasta County generated a total of 3,131,054 MT CO<sub>2</sub>e, with the stationary sources being the largest source of emissions at 72% of total emissions. Transportation generated 8%, energy consumption generated 7%, forestry 5%, and agriculture 4%. When the agriculture, forestry, and stationary source sectors are removed in the jurisdictional inventory, baseline emissions drop considerably to 571,255 MT CO<sub>2</sub>e. In the jurisdictional inventory the transportation and energy sectors are the largest emissions sources at 43% and 36% respectively.

**Figure 3: 2008 Unincorporated County Total GHG Emissions Inventory**

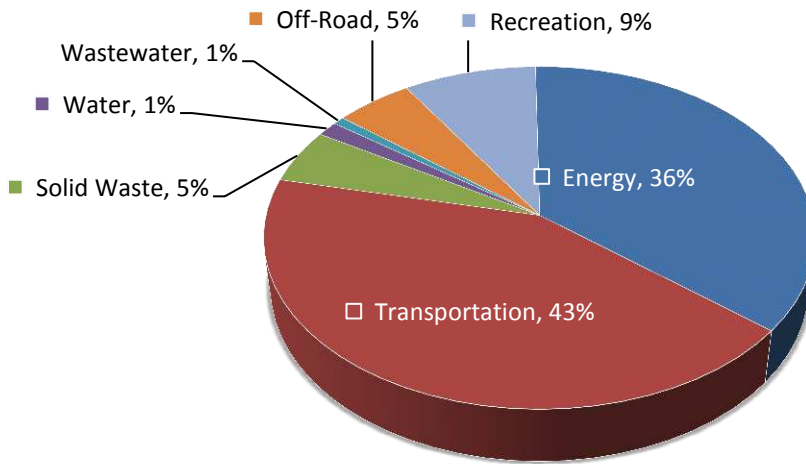


**Table 3: Unincorporated County 2008 Baseline GHG Inventory (Total and Jurisdictional)**

| Emissions Sector                | Total                 |             | Jurisdictional        |             |
|---------------------------------|-----------------------|-------------|-----------------------|-------------|
|                                 | MT CO <sub>2</sub> -e | %           | MT CO <sub>2</sub> -e | %           |
| Energy Consumption              | 206,309               | 7%          | 206,309               | 36%         |
| Transportation                  | 243,668               | 8%          | 243,668               | 43%         |
| Solid Waste                     | 29,233                | 1%          | 29,233                | 5%          |
| Water Consumption               | 8,001                 | 0.3%        | 8,001                 | 1%          |
| Wastewater Treatment            | 4,340                 | 0.1%        | 4,340                 | 1%          |
| Off-Road Vehicles and Equipment | 29,302                | 1%          | 29,302                | 5%          |
| Recreation                      | 50,401                | 2%          | 50,401                | 9%          |
| Agriculture                     | 132,234               | 4%          |                       |             |
| Forestry                        | 156,538               | 5%          |                       |             |
| Stationary Sources              | 2,271,027             | 73%         |                       |             |
| <b>Total</b>                    | <b>3,131,054</b>      | <b>100%</b> | <b>571,255</b>        | <b>100%</b> |

*Note: The GHG emissions for agriculture, forestry, and stationary sources related activities have only been reported in the Total inventory, and will not be considered for emissions projection, target-setting and measure development in the RCAP.*

**Figure 4: 2008 Unincorporated County Jurisdictional GHG Emissions Inventory**



### Jurisdictional Emission Forecasts

The GHG emissions in the unincorporated County were projected to be 632,133 MT CO<sub>2</sub>e in 2020, 754,190 MT CO<sub>2</sub>e in 2035, and 882,757 MT CO<sub>2</sub>e in 2050 which correspond to 11%, 32%, 55% growth from the 2008 baseline emissions in the short-, mid- and long-term. The chart below demonstrates that the transportation sector will remain the highest source of emissions, increasing by 13% in 2020, 38% in 2035, and 63% in 2050 from the base 2008 level. Under a business-as-usual scenario, GHG emissions related to the energy sector is also projected to increase by 10%, 30% and 54% in the short-, mid- and long-term. Another notably large source of emissions in the unincorporated County is recreation uses including watercraft and off-highway vehicles.

**Figure 5: Unincorporated County Jurisdictional GHG Emissions Forecasts**

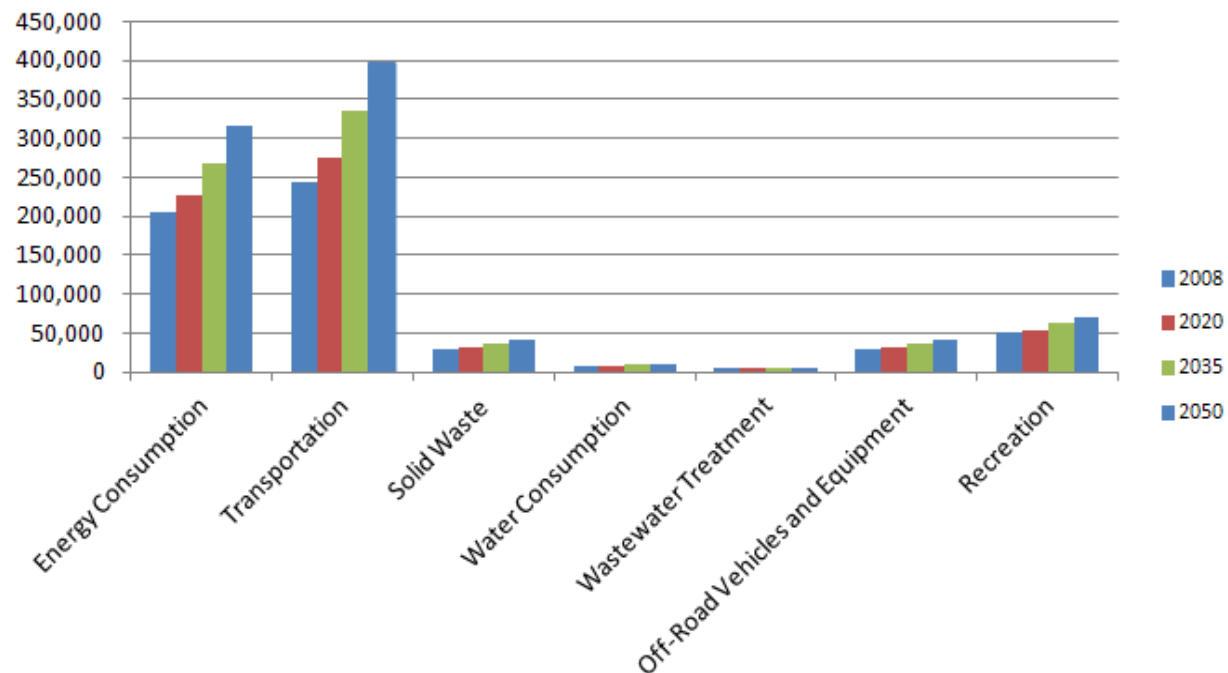


Table 4: Unincorporated County GHG Emissions Forecasts (Total and Jurisdictional)

| Total Unincorporated Shasta County Emissions Forecasts |                  |             |                  |             |                  |             |                  |             |
|--|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
|  | 2008             |             | 2020             |             | 2035             |             | 2050             |             |
| Emissions Sector                                       | MT CO2-e         | %           | MT CO2-e         | %           | MT CO2-e         | %           | MT CO2-e         | %           |
| Energy Consumption                                     | 206,309          | 7%          | 226,132          | 7%          | 268,384          | 8%          | 317,117          | 9%          |
| Transportation   | 243,668          | 8%          | 275,326          | 9%          | 335,539          | 10%         | 397,095          | 12%         |
| Solid Waste  | 29,233           | 1%          | 31,498           | 1%          | 36,221           | 1%          | 40,627           | 1%          |
| Water Consumption                                      | 8,001            | 0%          | 8,621            | 0%          | 9,914            | 0%          | 11,120           | 0%          |
| Wastewater Treatment                                   | 4,340            | 0%          | 4,677            | 0%          | 5,378            | 0%          | 6,032            | 0%          |
| Off-Road Vehicles and Equipment                        | 29,302           | 1%          | 31,572           | 1%          | 36,306           | 1%          | 40,723           | 1%          |
| Recreation   | 50,401           | 2%          | 54,305           | 2%          | 62,448           | 2%          | 70,044           | 2%          |
| Agriculture  | 132,234          | 4%          | 132,234          | 4%          | 132,234          | 4%          | 132,234          | 4%          |
| Forestry   | 156,538          | 5%          | 156,538          | 5%          | 156,538          | 5%          | 156,538          | 5%          |
| Stationary Sources                                     | 2,271,027        | 73%         | 2,271,027        | 71%         | 2,271,027        | 69%         | 2,271,027        | 66%         |
| <b>Total</b>   | <b>3,131,054</b> | <b>100%</b> | <b>3,191,931</b> | <b>100%</b> | <b>3,313,989</b> | <b>100%</b> | <b>3,442,556</b> | <b>100%</b> |

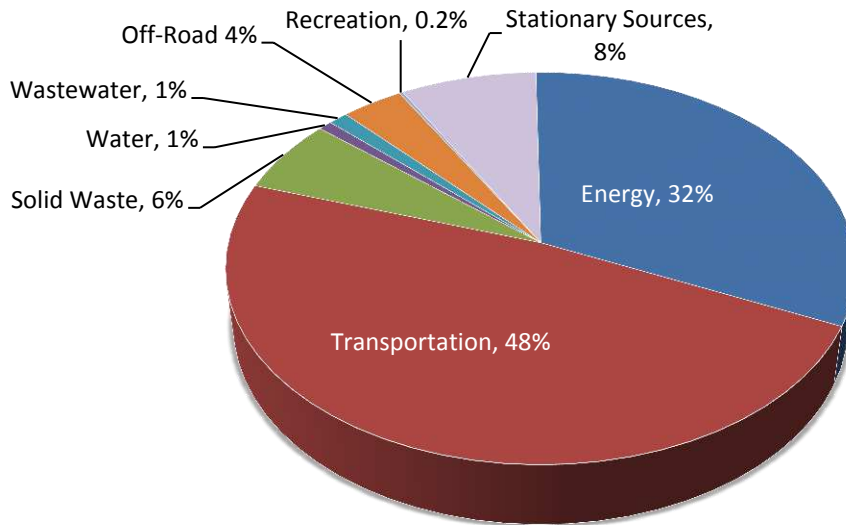
| Jurisdictional Unincorporated Shasta County Emissions Forecasts |                |             |                |             |                |             |                |             |
|---|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|
|   | 2008           |             | 2020           |             | 2035           |             | 2050           |             |
| Emissions Sector  | MT CO2-e       | %           | MT CO2-e       | %           | MT CO2-e       | %           | MT CO2-e       | %           |
| Energy Consumption  | 206,309        | 36%         | 226,132        | 36%         | 268,384        | 36%         | 317,117        | 36%         |
| Transportation  | 243,668        | 43%         | 275,326        | 44%         | 335,539        | 44%         | 397,095        | 45%         |
| Solid Waste   | 29,233         | 5%          | 31,498         | 5%          | 36,221         | 5%          | 40,627         | 5%          |
| Water Consumption   | 8,001          | 1%          | 8,621          | 1%          | 9,914          | 1%          | 11,120         | 1%          |
| Wastewater Treatment  | 4,340          | 1%          | 4,677          | 1%          | 5,378          | 1%          | 6,032          | 1%          |
| Off-Road Vehicles and Equipment                                 | 29,302         | 5%          | 31,572         | 5%          | 36,306         | 5%          | 40,723         | 5%          |
| Recreation  | 50,401         | 9%          | 54,305         | 9%          | 62,448         | 8%          | 70,044         | 8%          |
| <b>Total</b>  | <b>571,255</b> | <b>100%</b> | <b>632,133</b> | <b>100%</b> | <b>754,190</b> | <b>100%</b> | <b>882,757</b> | <b>100%</b> |

## City of Redding

### ► GHG Emissions Inventory

The 2008 baseline emissions inventory identified total citywide emissions of 1,040,919 MT CO<sub>2</sub>e. As shown in Figure 6 and Table 5, transportation emissions were the highest source at 48% of the total emissions in 2008, followed by energy consumption at 32% of the total emissions. Stationary sources make up only 8% of the city's total emissions. There are no agriculture or forestry emissions generated inside the City. After the removal of the stationary source emissions, the City's jurisdictional inventory consists of 958,570 MT CO<sub>2</sub>e. Within the jurisdictional inventory, the transportation sector makes up 52% of the total and the energy sector makes up 35% of the total.

**Figure 6: 2008 City of Redding Total GHG Emissions Inventory**

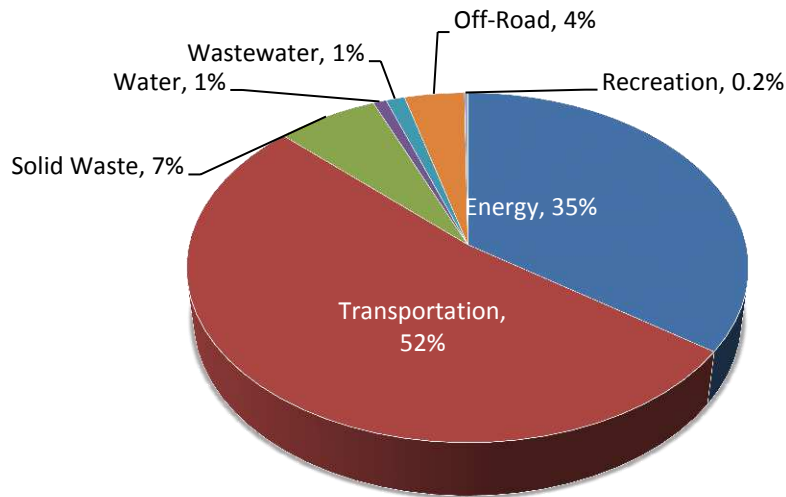


**Table 5: City of Redding 2008 Baseline GHG Inventory (Total and Jurisdictional)**

| Emissions Sector                | Total                 |             | Jurisdictional        |             |
|---------------------------------|-----------------------|-------------|-----------------------|-------------|
|                                 | MT CO <sub>2</sub> -e | %           | MT CO <sub>2</sub> -e | %           |
| Energy Consumption              | 333,253               | 32%         | 333,253               | 35%         |
| Transportation                  | 502,196               | 48%         | 502,196               | 52%         |
| Solid Waste                     | 63,653                | 6%          | 63,653                | 7%          |
| Water Consumption               | 8,208                 | 1%          | 8,208                 | 1%          |
| Wastewater Treatment            | 11,735                | 1%          | 11,735                | 1%          |
| Off-Road Vehicles and Equipment | 37,407                | 4%          | 37,407                | 4%          |
| Recreation                      | 2,117                 | 0.2%        | 2,117                 | 0.2%        |
| Stationary Sources              | 82,350                | 8%          |                       |             |
| <b>Total</b>                    | <b>1,040,919</b>      | <b>100%</b> | <b>958,570</b>        | <b>100%</b> |

*Note: The GHG emissions for stationary sources related activities have only been reported in the total inventory, and will not be considered for emissions projection, target-setting and measure development in the RCAP.*

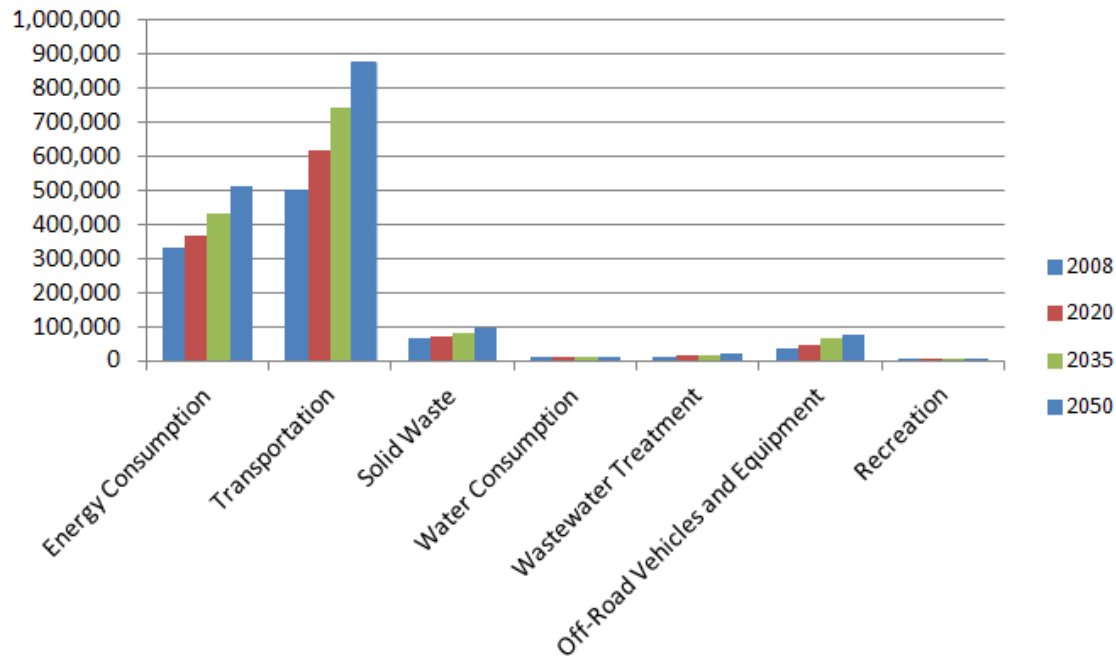
**Figure 7: 2008 City of Redding Jurisdictional GHG Emissions Inventory**



### Jurisdictional Emission Forecasts

The City of Redding's emissions are projected to be 1,115,897 MT CO<sub>2</sub>e in 2020, 1,331,537 MT CO<sub>2</sub>e in 2035, and 1,559,340 MT CO<sub>2</sub>e in 2050 which correspond to 16%, 39%, 63% growth in emissions in the short-, mid- and long-term respectively from the 2008 baseline emissions. If current land use planning and transportation trends continue, transportation sector will remain the highest source of emissions in the Redding, increasing by 61% in 2050 from 2008 levels. The chart below shows that emissions related to the energy sector is also projected to grow in the short-, mid- and long-term by 10%, 30% and 54% respectively from 2008 levels. Other sources of GHG emissions increase will be solid waste, and off-road vehicles and equipment sectors.

**Figure 9: City of Redding Jurisdictional GHG Emissions Forecasts**



**Table 6: City of Redding GHG Emissions Forecasts (Total and Jurisdictional)**

| <b>Total City of Redding Emissions Forecasts</b> |                  |             |                  |             |                  |             |                  |             |
|--|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
|  | <b>2008</b>      |             | <b>2020</b>      |             | <b>2035</b>      |             | <b>2050</b>      |             |
| <b>Emissions Sector</b>                          | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    |
| Energy Consumption                               | 333,253          | 32%         | 365,273          | 30%         | 433,524          | 31%         | 512,241          | 31%         |
| Transportation                                   | 502,196          | 48%         | 614,881          | 51%         | 744,531          | 53%         | 874,830          | 53%         |
| Solid Waste                                      | 63,653           | 6%          | 70,179           | 6%          | 79,350           | 6%          | 89,063           | 5%          |
| Water Consumption                                | 8,208            | 1%          | 9,050            | 1%          | 10,232           | 1%          | 11,485           | 1%          |
| Wastewater Treatment                             | 11,735           | 1%          | 12,939           | 1%          | 14,629           | 1%          | 16,420           | 1%          |
| Off-Road Vehicles and Equipment                  | 37,407           | 4%          | 41,242           | 3%          | 46,631           | 3%          | 52,339           | 3%          |
| Recreation                                       | 2,117            | 0%          | 2,334            | 0%          | 2,639            | 0%          | 2,962            | 0%          |
| Agriculture                                      | 0                | 0%          | 0                | 0%          | 0                | 0%          | 0                | 0%          |
| Forestry   | 0                | 0%          | 0                | 0%          | 0                | 0%          | 0                | 0%          |
| Stationary Sources                               | 82,350           | 8%          | 82,350           | 7%          | 82,350           | 6%          | 82,350           | 5%          |
| <b>Total</b>                                     | <b>1,040,919</b> | <b>100%</b> | <b>1,198,246</b> | <b>100%</b> | <b>1,413,887</b> | <b>100%</b> | <b>1,641,690</b> | <b>100%</b> |

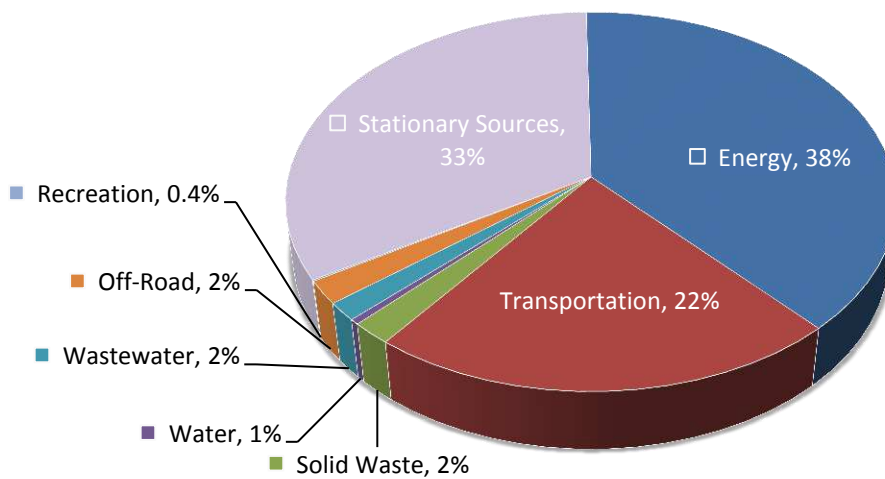
| <b>Jurisdictional City of Redding Emissions Forecasts</b> |                 |             |                  |             |                  |             |                  |             |
|---|-----------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
|   | <b>2008</b>     |             | <b>2020</b>      |             | <b>2035</b>      |             | <b>2050</b>      |             |
| <b>Emissions Sector</b>                                   | <b>MT CO2-e</b> | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    | <b>MT CO2-e</b>  | <b>%</b>    |
| Energy Consumption  | 333,253         | 35%         | 365,273          | 33%         | 433,524          | 33%         | 512,241          | 33%         |
| Transportation  | 502,196         | 52%         | 614,881          | 55%         | 744,531          | 56%         | 874,830          | 56%         |
| Solid Waste   | 63,653          | 7%          | 70,179           | 6%          | 79,350           | 6%          | 89,063           | 6%          |
| Water Consumption   | 8,208           | 1%          | 9,050            | 1%          | 10,232           | 1%          | 11,485           | 1%          |
| Wastewater Treatment                                      | 11,735          | 1%          | 12,939           | 1%          | 14,629           | 1%          | 16,420           | 1%          |
| Off-Road Vehicles and Equipment                           | 37,407          | 4%          | 41,242           | 4%          | 46,631           | 4%          | 52,339           | 3%          |
| Recreation  | 2,117           | 0%          | 2,334            | 0%          | 2,639            | 0%          | 2,962            | 0%          |
| <b>Total</b>  | <b>958,570</b>  | <b>100%</b> | <b>1,115,897</b> | <b>100%</b> | <b>1,331,537</b> | <b>100%</b> | <b>1,559,340</b> | <b>100%</b> |

## City of Shasta Lake

### ► GHG Emissions Inventory

In 2008, Shasta Lake generated a total of 215,988 MT CO<sub>2</sub>e, with energy-related emissions being the largest source. The stationary source sector is the second largest source of emissions at 33% of total emissions, followed by transportation emission at 22% of the total. There are no agriculture or forestry emissions generated inside the city. With the removal the stationary source emissions, the City's 2008 jurisdictional emissions are 143,950 MT CO<sub>2</sub>e. Within the jurisdictional inventory energy-related emissions contribute 58% of total emissions. Transportation emissions are the third largest source of emissions at 22% of the total emissions.

**Figure 8: 2008 City of Shasta Lake Total GHG Emissions Inventory**



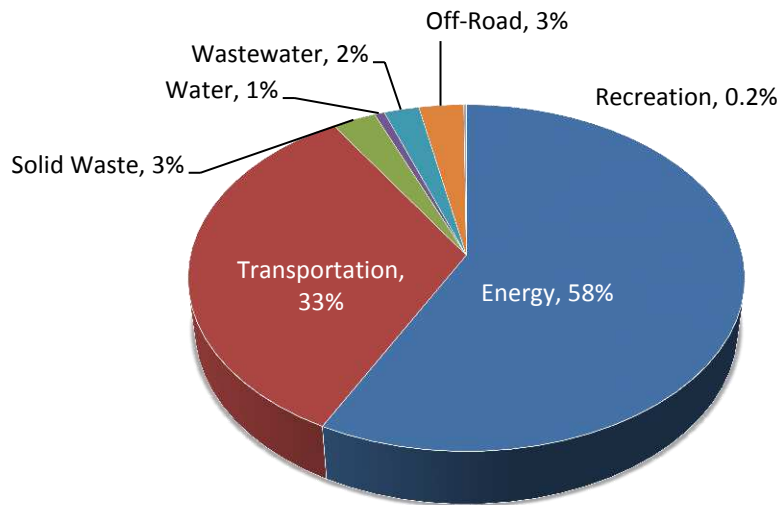
**Table 7: City of Shasta Lake 2008 Baseline GHG Inventory (Total and Jurisdictional)**

| Emissions Sector                | Total                 |             | Jurisdictional        |             |
|---------------------------------|-----------------------|-------------|-----------------------|-------------|
|                                 | MT CO <sub>2</sub> -e | %           | MT CO <sub>2</sub> -e | %           |
| Energy Consumption              | 82,943                | 38%         | 82,943                | 58%         |
| Transportation                  | 48,106                | 22%         | 48,106                | 33%         |
| Solid Waste                     | 4,139                 | 2%          | 4,139                 | 3%          |
| Water Consumption               | 946                   | 0.4%        | 946                   | 1%          |
| Wastewater Treatment            | 3,327                 | 2%          | 3,327                 | 2%          |
| Off-Road Vehicles and Equipment | 4,249                 | 2%          | 4,249                 | 3%          |
| Recreation                      | 240                   | 0.1%        | 240                   | 0.2%        |
| Stationary Sources              | 72,038                | 33%         |                       |             |
| <b>Total</b>                    | <b>215,988</b>        | <b>100%</b> | <b>143,950</b>        | <b>100%</b> |

*Note: The GHG emissions for stationary sources related activities have only been reported in the total inventory, and will not be considered for emissions projection, target-setting and measure development in the RCAP.*



**Figure 9: 2008 City of Shasta Lake Jurisdictional GHG Emissions Inventory**



► Jurisdictional Emission Forecasts

The City of Shasta Lake's emissions are projected to be 162,037 MT CO<sub>2</sub>e in 2020, 202,829 MT CO<sub>2</sub>e in 2035, and 250,700 MT CO<sub>2</sub>e in 2050 which correspond to 13%, 41%, 74% growth in emissions in the short-, mid- and long-term respectively from the 2008 baseline emissions.

The chart below shows that emissions related to the energy sector is projected to continue to be the largest source of emissions in Shasta Lake if energy practices and energy demand growth rates continues as anticipated. Emissions related to the energy sector are projected to grow by 90,912 MT CO<sub>2</sub>e in 2020, 107,899 MT CO<sub>2</sub>e in 2035 and 127,491 MT CO<sub>2</sub>e in 2050. Transportation sector shows the most dramatic rate of growth, increasing by almost 63% in 2035 from 2008 transportation emission levels. By 2050, emissions from the transportation sector are anticipated to increase by 117% from the 2008 levels.

**Figure 10: City of Shasta Lake Jurisdictional GHG Emissions Forecasts**

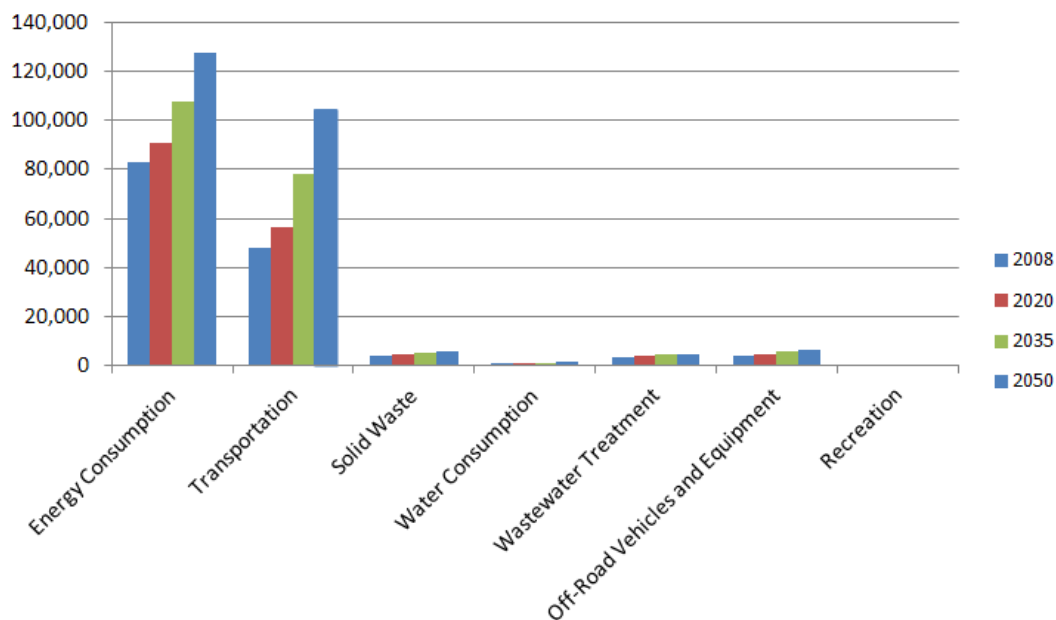




Table 8: City of Shasta Lake GHG Emissions Forecasts (Total and Jurisdictional)

| Total City of Shasta Lake Emissions Forecasts |                |             |                |             |                |             |                |             |
|---|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|
|   | 2008           |             | 2020           |             | 2035           |             | 2050           |             |
| Emissions Sector                              | MT CO2-e       | %           | MT CO2-e       | %           | MT CO2-e       | %           | MT CO2-e       | %           |
| Energy Consumption                            | 82,943         | 38%         | 90,912         | 39%         | 107,899        | 39%         | 127,491        | 40%         |
| Transportation                                | 48,106         | 22%         | 56,608         | 24%         | 78,196         | 28%         | 104,443        | 32%         |
| Solid Waste                                   | 4,139          | 2%          | 4,658          | 2%          | 5,369          | 2%          | 6,021          | 2%          |
| Water Consumption                             | 946            | 0%          | 1,065          | 0%          | 1,227          | 0%          | 1,376          | 0%          |
| Wastewater Treatment                          | 3,327          | 2%          | 3,744          | 2%          | 4,316          | 2%          | 4,840          | 1%          |
| Off-Road Vehicles and Equipment               | 4,249          | 2%          | 4,780          | 2%          | 5,511          | 2%          | 6,180          | 2%          |
| Recreation                                    | 240            | 0%          | 271            | 0%          | 312            | 0%          | 350            | 0%          |
| Agriculture                                   | 0              | 0%          | 0              | 0%          | 0              | 0%          | 0              | 0%          |
| Forestry                                      | 0              | 0%          | 0              | 0%          | 0              | 0%          | 0              | 0%          |
| Stationary Sources                            | 72,038         | 33%         | 72,038         | 31%         | 72,038         | 26%         | 72,038         | 22%         |
| <b>Total</b>                                  | <b>215,988</b> | <b>100%</b> | <b>234,075</b> | <b>100%</b> | <b>274,867</b> | <b>100%</b> | <b>322,739</b> | <b>100%</b> |

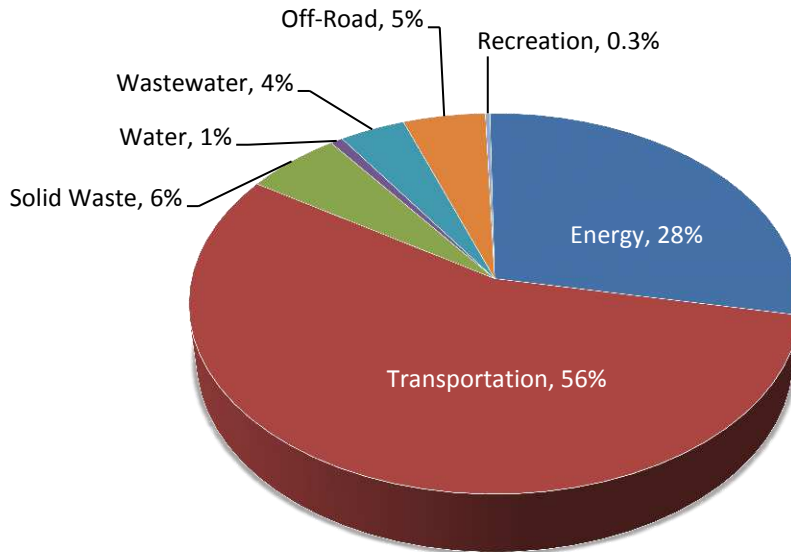
| Jurisdictional City of Shasta Lake Emissions Forecasts |                |             |                |             |                |             |                |             |
|--|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|
|  | 2008           |             | 2020           |             | 2035           |             | 2050           |             |
| Emissions Sector                                       | MT CO2-e       | %           | MT CO2-e       | %           | MT CO2-e       | %           | MT CO2-e       | %           |
| Energy Consumption                                     | 82,943         | 58%         | 90,912         | 56%         | 107,899        | 53%         | 127,491        | 51%         |
| Transportation   | 48,106         | 33%         | 56,608         | 35%         | 78,196         | 39%         | 104,443        | 42%         |
| Solid Waste  | 4,139          | 3%          | 4,658          | 3%          | 5,369          | 3%          | 6,021          | 2%          |
| Water Consumption                                      | 946            | 1%          | 1,065          | 1%          | 1,227          | 1%          | 1,376          | 1%          |
| Wastewater Treatment                                   | 3,327          | 2%          | 3,744          | 2%          | 4,316          | 2%          | 4,840          | 2%          |
| Off-Road Vehicles and Equipment                        | 4,249          | 3%          | 4,780          | 3%          | 5,511          | 3%          | 6,180          | 2%          |
| Recreation   | 240            | 0%          | 271            | 0%          | 312            | 0%          | 350            | 0%          |
| <b>Total</b>   | <b>143,950</b> | <b>100%</b> | <b>162,037</b> | <b>100%</b> | <b>202,829</b> | <b>100%</b> | <b>250,700</b> | <b>100%</b> |

# City of Anderson

## GHG Emissions Inventory

The 2008 baseline emissions inventory identified total citywide emissions of 88,625 MT CO<sub>2</sub>e. As shown in Figure 11 and Table 9, transportation emissions were the largest in Anderson generating 56% of the total emissions in 2008, followed by energy-related emissions at 28% of the total emissions. There are no agriculture, forestry, and stationary source emissions generated in the city, so the total and jurisdictional inventory are identical.

**Figure 11: 2008 City of Anderson Total and Jurisdictional GHG Emissions Inventory**



**Table 9: City of Anderson 2008 Baseline GHG Inventory (Total and Jurisdictional)**

| Emissions Sector                | Total                 |             | Jurisdictional        |             |
|---------------------------------|-----------------------|-------------|-----------------------|-------------|
|                                 | MT CO <sub>2</sub> -e | %           | MT CO <sub>2</sub> -e | %           |
| Energy Consumption              | 25,113                | 28%         | 25,113                | 28%         |
| Transportation                  | 49,679                | 56%         | 49,679                | 56%         |
| Solid Waste                     | 5,057                 | 6%          | 5,057                 | 6%          |
| Water Consumption               | 661                   | 1%          | 661                   | 1%          |
| Wastewater Treatment            | 3,495                 | 4%          | 3,495                 | 4%          |
| Off-Road Vehicles and Equipment | 4,372                 | 5%          | 4,372                 | 5%          |
| Recreation                      | 247                   | 0.3%        | 247                   | 0.3%        |
| Stationary Sources              | 0                     | 0%          |                       |             |
| <b>Total</b>                    | <b>88,625</b>         | <b>100%</b> | <b>88,625</b>         | <b>100%</b> |

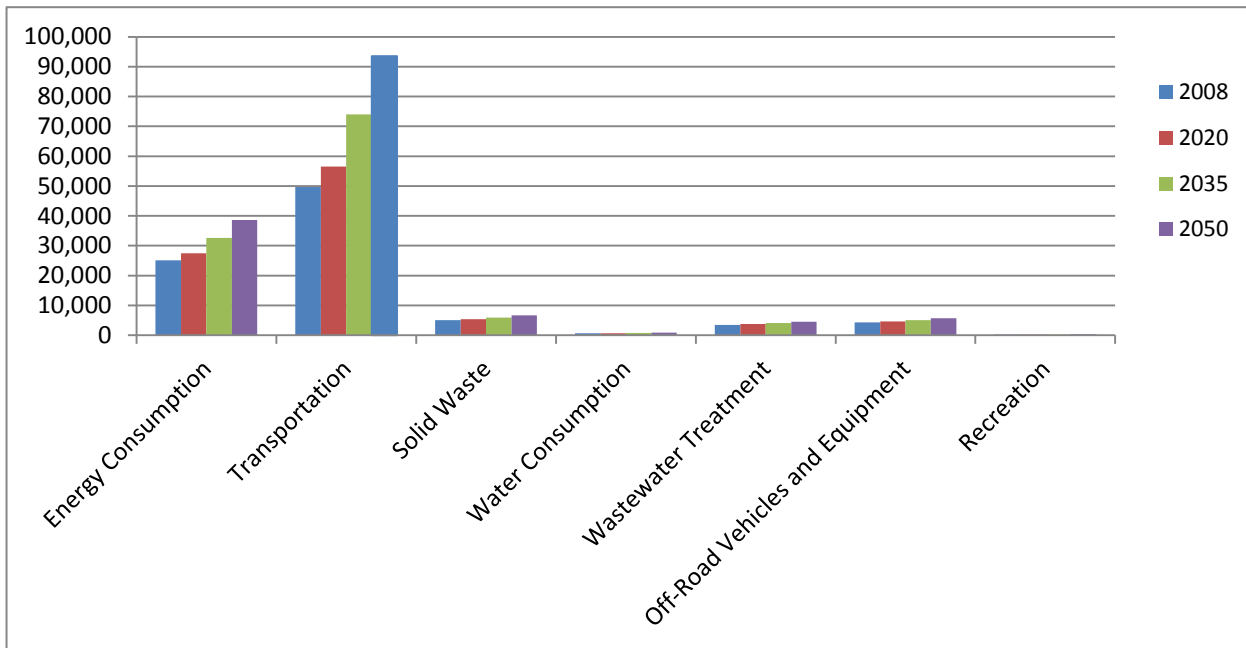
*Note: The GHG emissions for stationary sources related activities have only been reported in the total inventory, and will not be considered for emissions projection, target-setting and measure development in the RCAP.*

► Jurisdictional Emission Projections

The City of Anderson's emissions were projected to be 98,854 MT CO<sub>2</sub>e in 2020, 122,790 MT CO<sub>2</sub>e in 2035, and 150,302 MT CO<sub>2</sub>e in 2050 which correspond to 12%, 39%, 70% growth in emissions in the short-, mid- and long-term respectively from the 2008 baseline emissions.

Transportation sector shows a growth trend under the business-as-usual scenario, increasing by 14% in 2020, 49% in 2035, and 88% in 2050 from 2008 levels. Energy emissions will also continue to grow as the city grows in population in the short-, mid- and long-term and if energy practices and consumption rates continue in the same manner as 2008.

**Figure 12: City of Anderson GHG Emissions Forecasts**



**Table 10: City of Anderson GHG Emissions Forecasts (Total and Jurisdictional)**

| <b>Total City of Anderson Emissions Forecasts</b> |                 |             |                 |             |                 |             |                 |             |
|---|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
|   | <b>2008</b>     |             | <b>2020</b>     |             | <b>2035</b>     |             | <b>2050</b>     |             |
| <b>Emissions Sector</b>                           | <b>MT CO2-e</b> | <b>%</b>    | <b>MT CO2-e</b> | <b>%</b>    | <b>MT CO2-e</b> | <b>%</b>    | <b>MT CO2-e</b> | <b>%</b>    |
| Energy Consumption                                | 25,113          | 28%         | 27,526          | 28%         | 32,669          | 27%         | 38,601          | 26%         |
| Transportation                                    | 49,679          | 56%         | 56,520          | 57%         | 73,953          | 60%         | 93,560          | 62%         |
| Solid Waste                                       | 5,057           | 6%          | 5,414           | 5%          | 5,911           | 5%          | 6,632           | 4%          |
| Water Consumption                                 | 661             | 1%          | 708             | 1%          | 773             | 1%          | 867             | 1%          |
| Wastewater Treatment                              | 3,495           | 4%          | 3,741           | 4%          | 4,085           | 3%          | 4,583           | 3%          |
| Off-Road Vehicles and Equipment                   | 4,372           | 5%          | 4,680           | 5%          | 5,110           | 4%          | 5,734           | 4%          |
| Recreation  | 247             | 0%          | 265             | 0%          | 289             | 0%          | 324             | 0%          |
| Agriculture                                       | 0               | 0%          | 0               | 0%          | 0               | 0%          | 0               | 0%          |
| Forestry  | 0               | 0%          | 0               | 0%          | 0               | 0%          | 0               | 0%          |
| Stationary Sources                                | 0               | 0%          | 0               | 0%          | 0               | 0%          | 0               | 0%          |
| <b>Total</b>                                      | <b>88,625</b>   | <b>100%</b> | <b>98,854</b>   | <b>100%</b> | <b>122,790</b>  | <b>100%</b> | <b>150,302</b>  | <b>100%</b> |

| <b>Jurisdictional City of Anderson Emissions Forecasts</b> |                 |             |                 |             |                 |             |                 |             |
|--|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
|  | <b>2008</b>     |             | <b>2020</b>     |             | <b>2035</b>     |             | <b>2050</b>     |             |
| <b>Emissions Sector</b>                                    | <b>MT CO2-e</b> | <b>%</b>    | <b>MT CO2-e</b> | <b>%</b>    | <b>MT CO2-e</b> | <b>%</b>    | <b>MT CO2-e</b> | <b>%</b>    |
| Energy Consumption   | 25,113          | 28%         | 27,526          | 28%         | 32,669          | 27%         | 38,601          | 26%         |
| Transportation   | 49,679          | 56%         | 56,520          | 57%         | 73,953          | 60%         | 93,560          | 62%         |
| Solid Waste  | 5,057           | 6%          | 5,414           | 5%          | 5,911           | 5%          | 6,632           | 4%          |
| Water Consumption  | 661             | 1%          | 708             | 1%          | 773             | 1%          | 867             | 1%          |
| Wastewater Treatment                                       | 3,495           | 4%          | 3,741           | 4%          | 4,085           | 3%          | 4,583           | 3%          |
| Off-Road Vehicles and Equipment                            | 4,372           | 5%          | 4,680           | 5%          | 5,110           | 4%          | 5,734           | 4%          |
| Recreation   | 247             | 0%          | 265             | 0%          | 289             | 0%          | 324             | 0%          |
| <b>Total</b>   | <b>88,625</b>   | <b>100%</b> | <b>98,854</b>   | <b>100%</b> | <b>122,790</b>  | <b>100%</b> | <b>150,302</b>  | <b>100%</b> |

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## File Index

0.1 File Index.xlsx

This index shows the organization of the multiple spreadsheets that comprise the 2008 GHG inventory and projections.

| #                                      | Spreadsheet Name (*.xlsx)     |
|--|-------------------------------|
| <b>000 Series - File Organization</b>  |                               |
| 0.1                                    | File Index                    |
| 1.0                                    | Inventory Summary             |
| 4.0                                    | Population in Base Year 2008  |
| 5.0                                    | References                    |
| 6.0                                    | Unit Conversions              |
| <b>100 Series - Agriculture</b>        |                               |
| 101                                    | Agriculture Sector Summary    |
| 110                                    | Livestock                     |
| 120                                    | Farm Equipment                |
| 130                                    | Irrigation Pumps              |
| 150                                    | Fertilizer                    |
| 151                                    | Urea                          |
| 152                                    | Liming                        |
| 160                                    | Pesticide                     |
| 180                                    | Residue Burning               |
| 190                                    | Rice Field Decomposition      |
| <b>200 Series - Offroad Vehicles</b>   |                               |
| 201                                    | Off-Road Equip Sector Summary |
| 210                                    | TRUs                          |
| 220                                    | Light Commercial Equipment    |
| 230                                    | Lawn and Garden Equipment     |
| 240                                    | C&M Equipment                 |
| <b>400 Series - Energy Consumption</b> |                               |
| 401                                    | Electricity Consumption       |
| 451                                    | Natural Gas Consumption       |
| <b>500 Series - Solid Waste</b>        |                               |
| 501                                    | Solid Waste                   |
| <b>600 Series - Stationary Sources</b> |                               |
| 601                                    | Stationary Sources            |
| <b>700 Series - Transportation</b>     |                               |
| 701                                    | On-Road Vehicles              |
| <b>800 Series - Water Consumption</b>  |                               |
| 801                                    | Water Consumption             |
| <b>900 Series - Forest Management</b>  |                               |
| 901                                    | Forestry                      |
| <b>1000 Series - Wastewater</b>        |                               |
| 1001                                   | Wastewater Treatment          |
| <b>1100 Series - Recreation</b>        |                               |
| 1101                                   | Recreation Summary            |
| 1120                                   | Terrain Vehicles              |
| 1151                                   | Boats and Watercraft          |

| Emissions Sector                | Indicator                  | Percent Growth By Period                       |              |              | Source  | Methodology/Notes                                  |
|---------------------------------|----------------------------|--|--------------|--------------|---|--|
|                                 |                            | 2008 to 2020                                   | 2008 to 2035 | 2008 to 2050 |   |  |
| Energy Consumption              | % growth in utility demand | 9.6%   | 30.1%        | 53.7%        | wksht: Utility Demand Forecast  | Based on forecasts for energy consumption by REU   |
| Electricity                     | % growth in utility demand | 9.6%   | 30.1%        | 53.7%        | wksht: Utility Demand Forecast  | Based on forecasts for energy consumption by REU   |
| Natural Gas                     | % growth in utility demand | 9.6%   | 30.1%        | 53.7%        | wksht: Utility Demand Forecast  | Based on forecasts for energy consumption by REU   |
| Transportation (On-Road)        | Vehicle Miles Traveled     | See file 701 On-Road Vehicles                  |              |              | 701 On-Road Vehicles  | VMt analysis by Fehr and Peers                     |
| Solid Waste                     | SP - Redding               | 10.3%  | 24.7%        | 39.9%        | wksht: Alternative-Population Forecast Based on forecasts for Population and Jobs by Dowling Associates |  |
|                                 | SP - Anderson              | 7.0%   | 16.9%        | 31.1%        | wksht: Alternative-Population Forecast Based on forecasts for Population and Jobs by Dowling Associates |  |
|                                 | SP - Shasta Lake           | 12.5%  | 29.7%        | 45.5%        | wksht: Alternative-Population Forecast Based on forecasts for Population and Jobs by Dowling Associates |  |
|                                 | SP - Unincorporated        | 7.7%   | 23.9%        | 39.0%        | wksht: Alternative-Population Forecast Based on forecasts for Population and Jobs by Dowling Associates |  |
|                                 | SP - Total                 | 9.3%   | 24.2%        | 39.4%        | wksht: Alternative-Population Forecast Based on forecasts for Population and Jobs by Dowling Associates |  |
| Agriculture                     | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Livestock                       | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Farm Equipment                  | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Irrigation Pumps                | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Fertilizer Application          | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Urea Application                | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Lime Application                | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Pesticide Application           | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Residue Burning                 | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Rice Field Decomposition        | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Forestry                        | area of TPZ                | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Water Consumption               | Service Population         | See Solid Waste SP Indicators                  |              |              | wksht: Alternative-Population Forecast Based on forecasts for Population and Jobs by Dowling Associates |  |
| Wastewater Treatment            | Service Population         | See Solid Waste SP Indicators                  |              |              | wksht: Alternative-Population Forecast Based on forecasts for Population and Jobs by Dowling Associates |  |
| Off-Road Vehicles and Equipment |                            |  |              |              |   |  |
| TRUs                            | number of equipment        | See file 210 TRUs                              |              |              | ARB's OFFROAD model   | Increases are estimated directly by OFFROAD model. |
| Light Commercial Equipment      | number of equipment        | See file 220 Light Commercial Equipment        |              |              | ARB's OFFROAD model   | Increases are estimated directly by OFFROAD model. |
| Lawn and Garden Equipment       | number of equipment        | See file 230 Lawn and Garden Equipment         |              |              | ARB's OFFROAD model   | Increases are estimated directly by OFFROAD model. |
| Construction & Mining           | number of equipment        | See file 240 Construction and Mining Equipment |              |              | ARB's OFFROAD model   | Increases are estimated directly by OFFROAD model. |
| Recreation                      |                            |  |              |              |   |  |
| Terrain Vehicles                | number of equipment        | See file 1101 Terrain Vehicles                 |              |              | ARB's OFFROAD model   | Increases are estimated directly by OFFROAD model. |
| Boats and Watercraft            | number of equipment        | See file 1151 Boats and Watercraft             |              |              | ARB's OFFROAD model   | Increases are estimated directly by OFFROAD model. |
| Stationary Sources              | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Non-Biomass Combustion          | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |
| Biomass Combustion (biogenic)   | NA                         | 0%   | 0%           | 0%           | assumed to remain constant  | assumption   |

Notes

NA = not applicable because this emissions sector is assumed to stay the same

GHG Emissions Associated with Septic Tanks Serving Unincorporated Shasta County



Fugitive Methane Emissions from Septic Systems

|  | <u>value</u> | <u>units</u>          | <u>source</u>                                       |
|--|--------------|-----------------------|---|
| population served by septic tanks in Uninc County      | 8,326        | population            | wksht: 3 Population Served by WWTP                  |
| BOD Load   | 0.090        | kg/person/day         | Ref 32, Equation 10.6, pg. 113                      |
| maximum CH4-producing capacity for domestic wastewater | 0.6          | kg CH4/kg BOD removed | Ref 32, Equation 10.6, pg. 113                      |
| CH4 correction factor for anaerobic systems            | 0.5          | fraction              | Ref 32, Equation 10.6, pg. 113                      |
| time conversion factor                                 | 365          | days/year             | 6.0 Unit Conversions.xlsx                           |
| mass conversion factor                                 | 1,000        | kg/MT                 | 6.0 Unit Conversions.xlsx                           |
| global warming potential of CH4                        | 21           | unitless              | 6.0 Unit Conversions.xlsx                           |
| CO2-e emissions  | <b>1,723</b> | MT/year               | calculation using Equation 10.6 from Ref 32, pg. 13 |



**Agriculture Sector Summary**  
**Greenhouse Gas Inventory, 2008 Base Year**  
**Agriculture Sector**  
101 Agriculture Sector Summary.xlsx



|                              | <u>CO2-e</u><br><u>Emissions</u><br><u>(MT/year)</u> | <u>Source File</u>                | <u>Key Indicator</u> | <u>(units)</u>                         |
|------------------------------|--|-----------------------------------|----------------------|--|
| 110 Livestock                | 40,516   | 110 Livestock.xlsx                | 0                    | head of livestock                      |
| 120 Farm Equipment           | 21,910   | 120 Farm Equipment.xlsx           | 2,011                | hr/day                                 |
| 130 Irrigation Pumps         | 7,615  | 130 Irrigation Pumps.xlsx         | 113                  | number of pumps, size, age             |
| 150 Fertilizer Application   | 39,320   | 150 Fertilizer Application.xlsx   | 10,170               | fertilizer application (MT/year, as N) |
| 151 Urea Application         | 2,367  | 151 Urea Application.xlsx         | 3,230                | mass of urea applied (MT/year)         |
| 152 Lime Application         | 8,978  | 152 Lime Application.xlsx         | 20,419               | mass of lime applied (MT/year)         |
| 160 Pesticide Application    | 436  | 160 Pesticide Application.xlsx    | 0                    | mass of pesticide applied (lb/year)    |
| 180 Residue Burning          | 4,561  | 180 Residue Burning.xlsx          | 7,240                | acres burned per year                  |
| 190 Rice Field Decomposition | 6,532  | 190 Rice Field Decomposition.xlsx | 6,300                | acres/year                             |
| <b>Total</b>                 | <b>132,234</b>                                       |                                   |                      |  |

| <b>Breakdown by Jurisdiction</b>         | <u>Redding</u> | <u>Anderson</u> | <u>Shasta Lake</u> | <u>Unincorp. County</u> | <u>County Total</u> | <u>units</u> | <u>source</u> |
|--|----------------|-----------------|--------------------|-------------------------|---------------------|--------------|---------------|
| percentage breakdown by jurisdiction     | 0%             | 0%              | 0%                 | 100%                    | 100%                | %            | See Note 1    |
| breakdown of CO2-e emissions , by source |                |                 |                    |                         |                     | MT/year      | calculation   |
| 110 Livestock                            | 0              | 0               | 0                  | 40,516                  | 40,516              | MT/year      | calculation   |
| 120 Farm Equipment                       | 0              | 0               | 0                  | 21,910                  | 21,910              | MT/year      | calculation   |
| 130 Irrigation Pumps                     | 0              | 0               | 0                  | 7,615                   | 7,615               | MT/year      | calculation   |
| 150 Fertilizer Application               | 0              | 0               | 0                  | 39,320                  | 39,320              | MT/year      | calculation   |
| 151 Urea Application                     | 0              | 0               | 0                  | 2,367                   | 2,367               | MT/year      | calculation   |
| 152 Lime Application                     | 0              | 0               | 0                  | 8,978                   | 8,978               | MT/year      | calculation   |
| 160 Pesticide Application                | 0              | 0               | 0                  | 436                     | 436                 | MT/year      | calculation   |
| 180 Residue Burning                      | 0              | 0               | 0                  | 4,561                   | 4,561               | MT/year      | calculation   |
| 190 Rice Field Decomposition             | 0              | 0               | 0                  | 6,532                   | 6,532               | MT/year      | calculation   |
| Total                                    | 0              | 0               | 0                  | 132,234                 | 132,234             | MT/year      | summation     |

Notes

- 1 It is assumed that all agricultural equipment is operated in unincorporated areas of the county.

| Progam | Year | Period     | Geo Level | State      | State Fips | Ag District     | Ag District Code | County | County Code | Zip Code | Region | Watershed | Data Item                                    | Domain | Domain Category | Value |
|--------|------|------------|-----------|------------|------------|-----------------|------------------|--------|-------------|----------|--------|-----------|--|--------|-----------------|-------|
| CENSUS | 2007 | END OF DEC | COUNTY    | CALIFORNIA | 6          | SISKIYOU-SHASTA | 20               | SHASTA | 89          |          |        |           | EQUINE, HORSES & PONIES, OWNED - INVENTORY   | TOTAL  | NOT SPECIFIED   | 3,463 |
| CENSUS | 2007 | END OF DEC | COUNTY    | CALIFORNIA | 6          | SISKIYOU-SHASTA | 20               | SHASTA | 89          |          |        |           | EQUINE, MULES & BURROS & DONKEYS - INVENTORY | TOTAL  | NOT SPECIFIED   | 420   |
| CENSUS | 2002 | END OF DEC | COUNTY    | CALIFORNIA | 6          | SISKIYOU-SHASTA | 20               | SHASTA | 89          |          |        |           | EQUINE, MULES & BURROS & DONKEYS - INVENTORY | TOTAL  | NOT SPECIFIED   | 75    |

Source: Ref 12




Summary of Greenhouse Gas Emissions from Off-Road Vehicles and Equipment (MT CO2-e)

|                              | Redding | Anderson | Shasta Lake | Unincorp.<br>County | County Total | Source                         |
|------------------------------|---------|----------|-------------|---------------------|--------------|--------------------------------|
| <b>2008 Base Year</b>        |         |          |             |                     |              |                                |
| Terrain Vehicles             | 2,117   | 247      | 240         | 1,658               | 4,263        | 1120 Terrain Vehicles.xlsx     |
| Boats and Watercraft         | 0       | 0        | 0           | 48,743              | 48,743       | 1151 Boats and Watercraft.xlsx |
| Total                        | 2,117   | 247      | 240         | 50,401              | 53,005       | summation                      |
| <b>Year 2020 Projections</b> |         |          |             |                     |              |                                |
| Terrain Vehicles             | 3,178   | 371      | 361         | 2,489               | 6,399        | 1120 Terrain Vehicles.xlsx     |
| Boats and Watercraft         | 0       | 0        | 0           | 69,965              | 69,965       | 1151 Boats and Watercraft.xlsx |
| Total                        | 3,178   | 371      | 361         | 72,454              | 76,364       | summation                      |
| <b>Year 2035 Projections</b> |         |          |             |                     |              |                                |
| Terrain Vehicles             | 4,601   | 538      | 523         | 3,604               | 9,266        | 1120 Terrain Vehicles.xlsx     |
| Boats and Watercraft         | 0       | 0        | 0           | 122,677             | 122,677      | 1151 Boats and Watercraft.xlsx |
| Total                        | 4,601   | 538      | 523         | 126,282             | 131,943      | summation                      |
| <b>Year 2050 Projections</b> |         |          |             |                     |              |                                |
| Terrain Vehicles             | 5,334   | 623      | 606         | 4,178               | 10,741       | 1120 Terrain Vehicles.xlsx     |
| Boats and Watercraft         | 0       | 0        | 0           | 153,133             | 153,133      | 1151 Boats and Watercraft.xlsx |
| Total                        | 5,334   | 623      | 606         | 157,311             | 163,874      | summation                      |


| Class of Equipment     | Equipment                    | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |  | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|------------------------|------------------------------|--------------------------|-------|--|--|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                        |                              |                          |       |  |  |                             |                                  |                           |                           |                           |                        |                      |
| Agricultural Equipment | 2-Wheel Tractors             | G4                       | 5     | U  |  | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 11                     | 5                    |
| Agricultural Equipment | 2-Wheel Tractors             | G4                       | 15    | U  |  | NHH                         | 5                                | 0.026                     | 0.000                     | 0.000                     | 12                     | 11                   |
| Agricultural Equipment | 2-Wheel Tractors             | G4                       | 25    | U  |  | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Agricultural Mowers          | G4                       | 15    | U  |  | NHH                         | 2                                | 0.010                     | 0.000                     | 0.000                     | 11                     | 5                    |
| Agricultural Equipment | Agricultural Mowers          | G4                       | 25    | U  |  | NHH                         | 4                                | 0.018                     | 0.000                     | 0.000                     | 9                      | 4                    |
| Agricultural Equipment | Agricultural Mowers          | D                        | 120   | U  |  | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Agricultural Tractors        | G4                       | 120   | U  |  | NHH                         | 25                               | 0.218                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Agricultural Equipment | Agricultural Tractors        | G4                       | 175   | U  |  | NHH                         | 5                                | 0.044                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Agricultural Equipment | Agricultural Tractors        | D                        | 15    | U  |  | NHH                         | 72                               | 0.791                     | 0.000                     | 0.000                     | 103                    | 150                  |
| Agricultural Equipment | Agricultural Tractors        | D                        | 25    | U  |  | NHH                         | 170                              | 1.869                     | 0.000                     | 0.000                     | 127                    | 185                  |
| Agricultural Equipment | Agricultural Tractors        | D                        | 50    | U  |  | NHH                         | 602                              | 6.598                     | 0.000                     | 0.000                     | 296                    | 386                  |
| Agricultural Equipment | Agricultural Tractors        | D                        | 120   | U  |  | NHH                         | 1,478                            | 16.239                    | 0.000                     | 0.000                     | 342                    | 446                  |
| Agricultural Equipment | Agricultural Tractors        | D                        | 175   | U  |  | NHH                         | 1,422                            | 15.646                    | 0.000                     | 0.000                     | 193                    | 251                  |
| Agricultural Equipment | Agricultural Tractors        | D                        | 250   | U  |  | NHH                         | 1,306                            | 14.448                    | 0.000                     | 0.000                     | 125                    | 162                  |
| Agricultural Equipment | Agricultural Tractors        | D                        | 500   | U  |  | NHH                         | 424                              | 4.693                     | 0.000                     | 0.000                     | 25                     | 32                   |
| Agricultural Equipment | Balers                       | G4                       | 50    | U  |  | NHH                         | 4                                | 0.038                     | 0.000                     | 0.000                     | 12                     | 2                    |
| Agricultural Equipment | Balers                       | G4                       | 120   | U  |  | NHH                         | 4                                | 0.035                     | 0.000                     | 0.000                     | 6                      | 1                    |
| Agricultural Equipment | Balers                       | D                        | 50    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Balers                       | D                        | 120   | U  |  | NHH                         | 6                                | 0.068                     | 0.000                     | 0.000                     | 10                     | 3                    |
| Agricultural Equipment | Combines                     | G4                       | 120   | U  |  | NHH                         | 2                                | 0.019                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment | Combines                     | G4                       | 175   | U  |  | NHH                         | 2                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Combines                     | G4                       | 250   | U  |  | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Combines                     | D                        | 120   | U  |  | NHH                         | 13                               | 0.141                     | 0.000                     | 0.000                     | 7                      | 3                    |
| Agricultural Equipment | Combines                     | D                        | 175   | U  |  | NHH                         | 25                               | 0.275                     | 0.000                     | 0.000                     | 11                     | 4                    |
| Agricultural Equipment | Combines                     | D                        | 250   | U  |  | NHH                         | 37                               | 0.414                     | 0.000                     | 0.000                     | 11                     | 5                    |
| Agricultural Equipment | Combines                     | D                        | 500   | U  |  | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | G4                       | 5     | U  |  | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 3                      | 1                    |
| Agricultural Equipment | Hydro Power Units            | G4                       | 15    | U  |  | NHH                         | 3                                | 0.014                     | 0.000                     | 0.000                     | 5                      | 6                    |
| Agricultural Equipment | Hydro Power Units            | G4                       | 25    | U  |  | NHH                         | 2                                | 0.011                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Agricultural Equipment | Hydro Power Units            | G4                       | 50    | U  |  | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | G4                       | 120   | U  |  | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | D                        | 15    | U  |  | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Agricultural Equipment | Hydro Power Units            | D                        | 25    | U  |  | NHH                         | 1                                | 0.015                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Agricultural Equipment | Hydro Power Units            | D                        | 50    | U  |  | NHH                         | 3                                | 0.031                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Agricultural Equipment | Hydro Power Units            | D                        | 120   | U  |  | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 5     | U  |  | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 15    | U  |  | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 25    | U  |  | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 50    | U  |  | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 120   | U  |  | NHH                         | 3                                | 0.023                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 175   | U  |  | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 250   | U  |  | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 15    | U  |  | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 25    | U  |  | NHH                         | 3                                | 0.035                     | 0.000                     | 0.000                     | 4                      | 5                    |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 50    | U  |  | NHH                         | 4                                | 0.047                     | 0.000                     | 0.000                     | 4                      | 4                    |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 120   | U  |  | NHH                         | 29                               | 0.318                     | 0.000                     | 0.000                     | 12                     | 12                   |



| Class of Equipment               | Equipment                    | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|----------------------------------|------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                                  |                              |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Agricultural Equipment           | Other Agricultural Equipment | D                        | 175   | U                          | NHH                         | 4                                | 0.048                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Agricultural Equipment           | Other Agricultural Equipment | D                        | 250   | U                          | NHH                         | 6                                | 0.070                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Agricultural Equipment           | Other Agricultural Equipment | D                        | 500   | U                          | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 5     | U                          | NHH                         | 2                                | 0.011                     | 0.000                     | 0.000                     | 42                     | 11                   |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 15    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 13                     | 3                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 25    | U                          | NHH                         | 8                                | 0.036                     | 0.000                     | 0.000                     | 34                     | 9                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 50    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 120   | U                          | NHH                         | 3                                | 0.025                     | 0.000                     | 0.000                     | 4                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 175   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 25    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 50    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 120   | U                          | NHH                         | 3                                | 0.032                     | 0.000                     | 0.000                     | 5                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 175   | U                          | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 2                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 250   | U                          | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 500   | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Swathers                     | G4                       | 120   | U                          | NHH                         | 14                               | 0.127                     | 0.000                     | 0.000                     | 12                     | 3                    |   |
| Agricultural Equipment           | Swathers                     | G4                       | 175   | U                          | NHH                         | 15                               | 0.138                     | 0.000                     | 0.000                     | 10                     | 2                    |   |
| Agricultural Equipment           | Swathers                     | D                        | 120   | U                          | NHH                         | 38                               | 0.422                     | 0.000                     | 0.000                     | 52                     | 16                   |   |
| Agricultural Equipment           | Swathers                     | D                        | 175   | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Tillers                      | G4                       | 15    | U                          | NHH                         | 134                              | 0.652                     | 0.000                     | 0.001                     | 1,423                  | 277                  |   |
| Agricultural Equipment           | Tillers                      | D                        | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Tillers                      | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Tillers                      | D                        | 500   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | A/C Tug Narrow Body          | G4                       | 175   | U                          | NHH                         | 2                                | 0.021                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | A/C Tug Narrow Body          | D                        | 250   | U                          | NHH                         | 8                                | 0.085                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Airport Ground Support Equipment | A/C Tug Wide Body            | G4                       | 500   | U                          | NHH                         | 2                                | 0.018                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | A/C Tug Wide Body            | D                        | 500   | U                          | NHH                         | 4                                | 0.048                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | G4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | C4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | D                        | 175   | U                          | NHH                         | 1                                | 0.014                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | D                        | 250   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | D                        | 500   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | G4                       | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 250   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 500   | U                          | NHH                         | 5                                | 0.054                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 750   | U                          | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Baggage Tug                  | G4                       | 120   | U                          | NHH                         | 21                               | 0.186                     | 0.000                     | 0.000                     | 2                      | 4                    |   |
| Airport Ground Support Equipment | Baggage Tug                  | C4                       | 120   | U                          | NHH                         | 5                                | 0.031                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Airport Ground Support Equipment | Baggage Tug                  | D                        | 120   | U                          | NHH                         | 9                                | 0.104                     | 0.000                     | 0.000                     | 1                      | 4                    |   |
| Airport Ground Support Equipment | Belt Loader                  | G4                       | 120   | U                          | NHH                         | 5                                | 0.044                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Airport Ground Support Equipment | Belt Loader                  | C4                       | 120   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Belt Loader                  | D                        | 120   | U                          | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Airport Ground Support Equipment | Bobtail                      | G4                       | 120   | U                          | NHH                         | 3                                | 0.030                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Airport Ground Support Equipment | Bobtail                      | C4                       | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Bobtail                      | D                        | 120   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |

| Class of Equipment               | Equipment         | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|----------------------------------|-------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
|                                  |                   |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |  |
| Airport Ground Support Equipment | Cargo Loader      | G4                       | 120   | U                          | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cargo Loader      | C4                       | 120   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cargo Loader      | D                        | 120   | U                          | NHH                         | 5                                | 0.051                     | 0.000                     | 0.000                     | 1                      | 2                    |  |
| Airport Ground Support Equipment | Cargo Tractor     | G4                       | 120   | U                          | NHH                         | 25                               | 0.208                     | 0.000                     | 0.000                     | 1                      | 5                    |  |
| Airport Ground Support Equipment | Cargo Tractor     | C4                       | 175   | U                          | NHH                         | 1                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cargo Tractor     | D                        | 120   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cart              | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Catering Truck    | G4                       | 250   | U                          | NHH                         | 4                                | 0.034                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Catering Truck    | C4                       | 250   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Catering Truck    | D                        | 250   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 500   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 750   | U                          | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Deicer            | G4                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Forklift          | G4                       | 50    | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Forklift          | C4                       | 50    | U                          | NHH                         | 1                                | 0.010                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Forklift          | D                        | 175   | U                          | NHH                         | 0                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Fuel Truck        | G4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Fuel Truck        | C4                       | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Fuel Truck        | D                        | 250   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | G4                       | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 120   | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 175   | U                          | NHH                         | 6                                | 0.066                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 250   | U                          | NHH                         | 9                                | 0.099                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 500   | U                          | NHH                         | 2                                | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 750   | U                          | NHH                         | 3                                | 0.036                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Ground Power Unit | G4                       | 175   | U                          | NHH                         | 3                                | 0.032                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Ground Power Unit | D                        | 175   | U                          | NHH                         | 13                               | 0.148                     | 0.000                     | 0.000                     | 1                      | 2                    |  |
| Airport Ground Support Equipment | Hydrant truck     | G4                       | 175   | U                          | NHH                         | 4                                | 0.035                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Hydrant Truck     | D                        | 175   | U                          | NHH                         | 0                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lav Cart          | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lav Truck         | G4                       | 175   | U                          | NHH                         | 2                                | 0.017                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Lav Truck         | C4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lav Truck         | D                        | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lift              | G4                       | 120   | U                          | NHH                         | 2                                | 0.015                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lift              | C4                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lift              | D                        | 120   | U                          | NHH                         | 1                                | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Maint. Truck      | G4                       | 175   | U                          | NHH                         | 2                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Other             | C4                       | 50    | U                          | NHH                         | 1                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Other GSE         | G4                       | 50    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Other GSE         | D                        | 175   | U                          | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Passenger Stand   | G4                       | 175   | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Passenger Stand   | C4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Passenger Stand   | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Service Truck     | G4                       | 250   | U                          | NHH                         | 5                                | 0.047                     | 0.000                     | 0.000                     | 1                      | 2                    |  |



| Class of Equipment                | Equipment                | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |   |
|-----------------------------------|--------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                                   |                          |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Airport Ground Support Equipment  | Service Truck            | C4                       | 250   | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment  | Service Truck            | D                        | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Sweeper                  | G4                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Sweeper                  | C4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Sweeper                  | D                        | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Water Truck              | G4                       | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 25    | U                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 50    | U                          | NHH                         | 1                                | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 120   | U                          | NHH                         | 1                                | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 25    | U                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 50    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 120   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 175   | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 25    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 50    | U                          | NHH                         | 5                                | 0.053                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 120   | U                          | NHH                         | 37                               | 0.404                     | 0.000                     | 0.000                     | 5                      | 10                   |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 175   | U                          | NHH                         | 16                               | 0.171                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 250   | U                          | NHH                         | 18                               | 0.196                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 500   | U                          | NHH                         | 65                               | 0.722                     | 0.000                     | 0.000                     | 2                      | 5                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 750   | U                          | NHH                         | 73                               | 0.807                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 1000  | U                          | NHH                         | 184                              | 2.041                     | 0.000                     | 0.000                     | 2                      | 4                    |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4                       | 5     | U                          | NHH                         | 6                                | 0.033                     | 0.000                     | 0.000                     | 94                     | 24                   |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4                       | 15    | U                          | NHH                         | 19                               | 0.089                     | 0.000                     | 0.000                     | 159                    | 40                   |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4                       | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | D                        | 15    | U                          | NHH                         | 1                                | 0.015                     | 0.000                     | 0.000                     | 6                      | 5                    |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | D                        | 25    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 5     | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 5                      | 2                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 15    | U                          | NHH                         | 14                               | 0.066                     | 0.000                     | 0.000                     | 23                     | 20                   |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 25    | U                          | NHH                         | 8                                | 0.039                     | 0.000                     | 0.000                     | 7                      | 6                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 50    | U                          | NHH                         | 2                                | 0.021                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 120   | U                          | NHH                         | 2                                | 0.022                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 50    | U                          | NHH                         | 1                                | 0.010                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 120   | U                          | NHH                         | 4                                | 0.041                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 175   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | G4                       | 50    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | G4                       | 120   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | G4                       | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | D                        | 50    | U                          | NHH                         | 1                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Construction and Mining Equipment | Cranes                   | D                        | 120   | U                          | NHH                         | 34                               | 0.372                     | 0.000                     | 0.000                     | 4                      | 15                   |   |
| Construction and Mining Equipment | Cranes                   | D                        | 175   | U                          | NHH                         | 54                               | 0.597                     | 0.000                     | 0.000                     | 4                      | 15                   |   |
| Construction and Mining Equipment | Cranes                   | D                        | 250   | U                          | NHH                         | 146                              | 1.614                     | 0.000                     | 0.000                     | 8                      | 29                   |   |
| Construction and Mining Equipment | Cranes                   | D                        | 500   | U                          | NHH                         | 86                               | 0.950                     | 0.000                     | 0.000                     | 3                      | 11                   |   |



| Class of Equipment                | Equipment                | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|--------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                          |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Cranes                   | D                        | 750   | U                          | NHH                         | 115                              | 1.274                     | 0.000                     | 0.000                     | 2                      | 8                    |
| Construction and Mining Equipment | Cranes                   | D                        | 9999  | U                          | NHH                         | 463                              | 5.123                     | 0.000                     | 0.000                     | 3                      | 11                   |
| Construction and Mining Equipment | Crawler Tractors         | D                        | 50    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crawler Tractors         | D                        | 120   | U                          | NHH                         | 762                              | 8.354                     | 0.000                     | 0.000                     | 90                     | 254                  |
| Construction and Mining Equipment | Crawler Tractors         | D                        | 175   | U                          | NHH                         | 474                              | 5.206                     | 0.000                     | 0.000                     | 31                     | 86                   |
| Construction and Mining Equipment | Crawler Tractors         | D                        | 250   | U                          | NHH                         | 555                              | 6.133                     | 0.000                     | 0.000                     | 26                     | 74                   |
| Construction and Mining Equipment | Crawler Tractors         | D                        | 500   | U                          | NHH                         | 593                              | 6.558                     | 0.000                     | 0.000                     | 18                     | 51                   |
| Construction and Mining Equipment | Crawler Tractors         | D                        | 750   | U                          | NHH                         | 58                               | 0.644                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Crawler Tractors         | D                        | 1000  | U                          | NHH                         | 82                               | 0.910                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4                       | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4                       | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4                       | 120   | U                          | NHH                         | 1                                | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                        | 50    | U                          | NHH                         | 10                               | 0.105                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                        | 120   | U                          | NHH                         | 51                               | 0.558                     | 0.000                     | 0.000                     | 5                      | 13                   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                        | 175   | U                          | NHH                         | 43                               | 0.476                     | 0.000                     | 0.000                     | 2                      | 6                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                        | 250   | U                          | NHH                         | 6                                | 0.069                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                        | 500   | U                          | NHH                         | 54                               | 0.595                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                        | 750   | U                          | NHH                         | 4                                | 0.047                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                        | 9999  | U                          | NHH                         | 10                               | 0.105                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                       | 5     | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 5                      | 2                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                       | 15    | U                          | NHH                         | 2                                | 0.007                     | 0.000                     | 0.000                     | 10                     | 4                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                       | 25    | U                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                       | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Dumpers/Tenders          | D                        | 25    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Excavators               | D                        | 25    | U                          | NHH                         | 1                                | 0.013                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Construction and Mining Equipment | Excavators               | D                        | 50    | U                          | NHH                         | 70                               | 0.764                     | 0.000                     | 0.000                     | 16                     | 61                   |
| Construction and Mining Equipment | Excavators               | D                        | 120   | U                          | NHH                         | 557                              | 6.110                     | 0.000                     | 0.000                     | 43                     | 166                  |
| Construction and Mining Equipment | Excavators               | D                        | 175   | U                          | NHH                         | 1,635                            | 17.966                    | 0.001                     | 0.000                     | 83                     | 320                  |
| Construction and Mining Equipment | Excavators               | D                        | 250   | U                          | NHH                         | 935                              | 10.331                    | 0.000                     | 0.000                     | 34                     | 130                  |
| Construction and Mining Equipment | Excavators               | D                        | 500   | U                          | NHH                         | 993                              | 10.977                    | 0.000                     | 0.000                     | 24                     | 94                   |
| Construction and Mining Equipment | Excavators               | D                        | 750   | U                          | NHH                         | 39                               | 0.433                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Graders                  | D                        | 50    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Graders                  | D                        | 120   | U                          | NHH                         | 93                               | 1.023                     | 0.000                     | 0.000                     | 11                     | 27                   |
| Construction and Mining Equipment | Graders                  | D                        | 175   | U                          | NHH                         | 526                              | 5.776                     | 0.000                     | 0.000                     | 36                     | 93                   |
| Construction and Mining Equipment | Graders                  | D                        | 250   | U                          | NHH                         | 450                              | 4.977                     | 0.000                     | 0.000                     | 23                     | 58                   |
| Construction and Mining Equipment | Graders                  | D                        | 500   | U                          | NHH                         | 17                               | 0.188                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Graders                  | D                        | 750   | U                          | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Off-Highway Tractors     | D                        | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Off-Highway Tractors     | D                        | 175   | U                          | NHH                         | 249                              | 2.737                     | 0.000                     | 0.000                     | 14                     | 42                   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                        | 250   | U                          | NHH                         | 234                              | 2.587                     | 0.000                     | 0.000                     | 13                     | 40                   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                        | 750   | U                          | NHH                         | 480                              | 5.301                     | 0.000                     | 0.000                     | 6                      | 19                   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                        | 1000  | U                          | NHH                         | 73                               | 0.801                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Off-Highway Trucks       | D                        | 175   | U                          | NHH                         | 23                               | 0.250                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Construction and Mining Equipment | Off-Highway Trucks       | D                        | 250   | U                          | NHH                         | 222                              | 2.457                     | 0.000                     | 0.000                     | 5                      | 30                   |
| Construction and Mining Equipment | Off-Highway Trucks       | D                        | 500   | U                          | NHH                         | 512                              | 5.657                     | 0.000                     | 0.000                     | 8                      | 42                   |
| Construction and Mining Equipment | Off-Highway Trucks       | D                        | 750   | U                          | NHH                         | 837                              | 9.248                     | 0.000                     | 0.000                     | 8                      | 42                   |






| Class of Equipment                | Equipment                    | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                              |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Off-Highway Trucks           | D                        | 1000  | U                          | NHH                         | 554                              | 6.128                     | 0.000                     | 0.000                     | 4                      | 20                   |
| Construction and Mining Equipment | Other Construction Equipment | G4                       | 175   | U                          | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 15    | U                          | NHH                         | 3                                | 0.036                     | 0.000                     | 0.000                     | 4                      | 7                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 25    | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 50    | U                          | NHH                         | 2                                | 0.026                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 120   | U                          | NHH                         | 11                               | 0.125                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 175   | U                          | NHH                         | 21                               | 0.227                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 500   | U                          | NHH                         | 114                              | 1.256                     | 0.000                     | 0.000                     | 5                      | 10                   |
| Construction and Mining Equipment | Pavers                       | D                        | 25    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Pavers                       | D                        | 50    | U                          | NHH                         | 29                               | 0.314                     | 0.000                     | 0.000                     | 10                     | 22                   |
| Construction and Mining Equipment | Pavers                       | D                        | 120   | U                          | NHH                         | 83                               | 0.915                     | 0.000                     | 0.000                     | 12                     | 26                   |
| Construction and Mining Equipment | Pavers                       | D                        | 175   | U                          | NHH                         | 96                               | 1.055                     | 0.000                     | 0.000                     | 7                      | 16                   |
| Construction and Mining Equipment | Pavers                       | D                        | 250   | U                          | NHH                         | 17                               | 0.193                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Pavers                       | D                        | 500   | U                          | NHH                         | 21                               | 0.237                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 5     | U                          | NHH                         | 6                                | 0.034                     | 0.000                     | 0.000                     | 66                     | 31                   |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 15    | U                          | NHH                         | 36                               | 0.171                     | 0.000                     | 0.000                     | 111                    | 61                   |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 25    | U                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 50    | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 120   | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 25    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 50    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 120   | U                          | NHH                         | 20                               | 0.224                     | 0.000                     | 0.000                     | 4                      | 8                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 175   | U                          | NHH                         | 18                               | 0.195                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 250   | U                          | NHH                         | 6                                | 0.067                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Plate Compactors             | G2                       | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Plate Compactors             | G4                       | 5     | U                          | NHH                         | 4                                | 0.024                     | 0.000                     | 0.000                     | 47                     | 23                   |
| Construction and Mining Equipment | Plate Compactors             | G4                       | 15    | U                          | NHH                         | 12                               | 0.059                     | 0.000                     | 0.000                     | 50                     | 28                   |
| Construction and Mining Equipment | Plate Compactors             | D                        | 15    | U                          | NHH                         | 1                                | 0.013                     | 0.000                     | 0.000                     | 4                      | 6                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 5     | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 5                      | 1                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 15    | U                          | NHH                         | 4                                | 0.019                     | 0.000                     | 0.000                     | 8                      | 7                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 25    | U                          | NHH                         | 6                                | 0.027                     | 0.000                     | 0.000                     | 6                      | 5                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 50    | U                          | NHH                         | 2                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 120   | U                          | NHH                         | 5                                | 0.041                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rollers                      | D                        | 15    | U                          | NHH                         | 4                                | 0.041                     | 0.000                     | 0.000                     | 7                      | 13                   |
| Construction and Mining Equipment | Rollers                      | D                        | 25    | U                          | NHH                         | 3                                | 0.037                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Construction and Mining Equipment | Rollers                      | D                        | 50    | U                          | NHH                         | 20                               | 0.222                     | 0.000                     | 0.000                     | 9                      | 17                   |
| Construction and Mining Equipment | Rollers                      | D                        | 120   | U                          | NHH                         | 247                              | 2.711                     | 0.000                     | 0.000                     | 48                     | 92                   |
| Construction and Mining Equipment | Rollers                      | D                        | 175   | U                          | NHH                         | 182                              | 1.998                     | 0.000                     | 0.000                     | 19                     | 37                   |
| Construction and Mining Equipment | Rollers                      | D                        | 250   | U                          | NHH                         | 36                               | 0.401                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Construction and Mining Equipment | Rollers                      | D                        | 500   | U                          | NHH                         | 36                               | 0.403                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | G4                       | 50    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | G4                       | 120   | U                          | NHH                         | 5                                | 0.047                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | G4                       | 175   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | D                        | 50    | U                          | NHH                         | 6                                | 0.066                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | D                        | 120   | U                          | NHH                         | 532                              | 5.840                     | 0.000                     | 0.000                     | 61                     | 187                  |
| Construction and Mining Equipment | Rough Terrain Forklifts      | D                        | 175   | U                          | NHH                         | 136                              | 1.496                     | 0.000                     | 0.000                     | 8                      | 24                   |

| Class of Equipment                | Equipment               | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|-----------------------------------|-------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
|                                   |                         |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |  |
| Construction and Mining Equipment | Rough Terrain Forklifts | D                        | 250   | U                          | NHH                         | 10                               | 0.114                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Rough Terrain Forklifts | D                        | 500   | U                          | NHH                         | 10                               | 0.113                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 175   | U                          | NHH                         | 3                                | 0.032                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 250   | U                          | NHH                         | 102                              | 1.124                     | 0.000                     | 0.000                     | 3                      | 12                   |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 500   | U                          | NHH                         | 226                              | 2.498                     | 0.000                     | 0.000                     | 4                      | 19                   |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 750   | U                          | NHH                         | 130                              | 1.437                     | 0.000                     | 0.000                     | 2                      | 7                    |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 1000  | U                          | NHH                         | 13                               | 0.144                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | G4                       | 50    | U                          | NHH                         | 1                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | G4                       | 120   | U                          | NHH                         | 6                                | 0.049                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 25    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 50    | U                          | NHH                         | 12                               | 0.127                     | 0.000                     | 0.000                     | 3                      | 8                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 120   | U                          | NHH                         | 597                              | 6.545                     | 0.000                     | 0.000                     | 84                     | 222                  |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 175   | U                          | NHH                         | 606                              | 6.658                     | 0.000                     | 0.000                     | 47                     | 125                  |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 250   | U                          | NHH                         | 839                              | 9.278                     | 0.000                     | 0.000                     | 47                     | 125                  |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 500   | U                          | NHH                         | 556                              | 6.142                     | 0.000                     | 0.000                     | 20                     | 52                   |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 750   | U                          | NHH                         | 86                               | 0.956                     | 0.000                     | 0.000                     | 1                      | 4                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 1000  | U                          | NHH                         | 11                               | 0.126                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Scrapers                | D                        | 120   | U                          | NHH                         | 6                                | 0.063                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Scrapers                | D                        | 175   | U                          | NHH                         | 82                               | 0.906                     | 0.000                     | 0.000                     | 4                      | 12                   |  |
| Construction and Mining Equipment | Scrapers                | D                        | 250   | U                          | NHH                         | 113                              | 1.249                     | 0.000                     | 0.000                     | 4                      | 12                   |  |
| Construction and Mining Equipment | Scrapers                | D                        | 500   | U                          | NHH                         | 477                              | 5.277                     | 0.000                     | 0.000                     | 11                     | 33                   |  |
| Construction and Mining Equipment | Scrapers                | D                        | 750   | U                          | NHH                         | 146                              | 1.618                     | 0.000                     | 0.000                     | 2                      | 6                    |  |
| Construction and Mining Equipment | Signal Boards           | G4                       | 5     | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Signal Boards           | G4                       | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 15    | U                          | NHH                         | 19                               | 0.203                     | 0.000                     | 0.000                     | 32                     | 66                   |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 50    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 120   | U                          | NHH                         | 14                               | 0.153                     | 0.000                     | 0.000                     | 3                      | 4                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 175   | U                          | NHH                         | 17                               | 0.183                     | 0.000                     | 0.000                     | 2                      | 2                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 250   | U                          | NHH                         | 6                                | 0.064                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 0                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 25    | U                          | NHH                         | 33                               | 0.153                     | 0.000                     | 0.000                     | 33                     | 29                   |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 50    | U                          | NHH                         | 7                                | 0.059                     | 0.000                     | 0.000                     | 4                      | 4                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 120   | U                          | NHH                         | 9                                | 0.088                     | 0.000                     | 0.000                     | 3                      | 2                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | D                        | 25    | U                          | NHH                         | 31                               | 0.344                     | 0.000                     | 0.000                     | 22                     | 50                   |  |
| Construction and Mining Equipment | Skid Steer Loaders      | D                        | 50    | U                          | NHH                         | 535                              | 5.854                     | 0.000                     | 0.000                     | 198                    | 459                  |  |
| Construction and Mining Equipment | Skid Steer Loaders      | D                        | 120   | U                          | NHH                         | 468                              | 5.140                     | 0.000                     | 0.000                     | 104                    | 241                  |  |
| Construction and Mining Equipment | Surfacing Equipment     | G4                       | 5     | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 12                     | 7                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | G4                       | 15    | U                          | NHH                         | 19                               | 0.092                     | 0.000                     | 0.000                     | 36                     | 50                   |  |
| Construction and Mining Equipment | Surfacing Equipment     | G4                       | 25    | U                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 50    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 250   | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 500   | U                          | NHH                         | 7                                | 0.077                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 750   | U                          | NHH                         | 7                                | 0.079                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Tampers/Rammers         | G2                       | 15    | U                          | NHH                         | 3                                | 0.014                     | 0.000                     | 0.000                     | 28                     | 14                   |  |




| Class of Equipment                | Equipment                 | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|---------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                           |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Tampers/Rammers           | G4                       | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | G4                       | 120   | U                          | NHH                         | 4                                | 0.035                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 25    | U                          | NHH                         | 6                                | 0.066                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 50    | U                          | NHH                         | 69                               | 0.758                     | 0.000                     | 0.000                     | 19                     | 50                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 120   | U                          | NHH                         | 1,576                            | 17.290                    | 0.001                     | 0.000                     | 257                    | 669                  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 175   | U                          | NHH                         | 230                              | 2.529                     | 0.000                     | 0.000                     | 19                     | 50                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 250   | U                          | NHH                         | 125                              | 1.386                     | 0.000                     | 0.000                     | 6                      | 16                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 500   | U                          | NHH                         | 406                              | 4.490                     | 0.000                     | 0.000                     | 10                     | 26                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 750   | U                          | NHH                         | 455                              | 5.027                     | 0.000                     | 0.000                     | 7                      | 19                   |
| Construction and Mining Equipment | Trenchers                 | G4                       | 15    | U                          | NHH                         | 8                                | 0.037                     | 0.000                     | 0.000                     | 10                     | 12                   |
| Construction and Mining Equipment | Trenchers                 | G4                       | 25    | U                          | NHH                         | 13                               | 0.059                     | 0.000                     | 0.000                     | 8                      | 9                    |
| Construction and Mining Equipment | Trenchers                 | G4                       | 50    | U                          | NHH                         | 7                                | 0.055                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Construction and Mining Equipment | Trenchers                 | G4                       | 120   | U                          | NHH                         | 4                                | 0.040                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 15    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 25    | U                          | NHH                         | 2                                | 0.025                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 50    | U                          | NHH                         | 88                               | 0.961                     | 0.000                     | 0.000                     | 34                     | 58                   |
| Construction and Mining Equipment | Trenchers                 | D                        | 120   | U                          | NHH                         | 234                              | 2.567                     | 0.000                     | 0.000                     | 46                     | 79                   |
| Construction and Mining Equipment | Trenchers                 | D                        | 175   | U                          | NHH                         | 57                               | 0.623                     | 0.000                     | 0.000                     | 5                      | 9                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 250   | U                          | NHH                         | 8                                | 0.087                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 500   | U                          | NHH                         | 14                               | 0.154                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 750   | U                          | NHH                         | 3                                | 0.037                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 1000  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Crane (Dredging)          | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Deck/door engine          | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 9999  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 9999  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment      | Equipment                         | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |  | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|-------------------------|-----------------------------------|--------------------------|-------|--|--|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                         |                                   |                          |       |  |  |                             |                                  |                           |                           |                           |                        |                      |   |
| Dredging                | Hoist/swing/winch                 | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Compressor (Entertainment)        | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 50    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 120   | U  |  | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 175   | U  |  | NHH                         | 3                                | 0.033                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 250   | U  |  | NHH                         | 6                                | 0.068                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 500   | U  |  | NHH                         | 13                               | 0.148                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 750   | U  |  | NHH                         | 5                                | 0.051                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 9999  | U  |  | NHH                         | 1                                | 0.013                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 15    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 25    | U  |  | NHH                         | 2                                | 0.011                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 50    | U  |  | NHH                         | 5                                | 0.040                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 120   | U  |  | NHH                         | 9                                | 0.081                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | C4                       | 15    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Aerial Lifts                      | C4                       | 25    | U  |  | NHH                         | 3                                | 0.019                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 15    | U  |  | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 25    | U  |  | NHH                         | 1                                | 0.014                     | 0.000                     | 0.000                     | 2                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 50    | U  |  | NHH                         | 8                                | 0.088                     | 0.000                     | 0.000                     | 9                      | 9                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 120   | U  |  | NHH                         | 14                               | 0.152                     | 0.000                     | 0.000                     | 8                      | 8                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 500   | U  |  | NHH                         | 10                               | 0.109                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 750   | U  |  | NHH                         | 1                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Forklifts                         | G4                       | 25    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Forklifts                         | G4                       | 50    | U  |  | NHH                         | 82                               | 0.542                     | 0.000                     | 0.000                     | 10                     | 51                   |   |
| Industrial Equipment    | Forklifts                         | G4                       | 120   | U  |  | NHH                         | 377                              | 3.213                     | 0.000                     | 0.001                     | 36                     | 179                  |   |
| Industrial Equipment    | Forklifts                         | G4                       | 175   | U  |  | NHH                         | 26                               | 0.238                     | 0.000                     | 0.000                     | 1                      | 7                    |   |
| Industrial Equipment    | Forklifts                         | C4                       | 25    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Forklifts                         | C4                       | 50    | U  |  | NHH                         | 125                              | 0.857                     | 0.001                     | 0.000                     | 19                     | 94                   |   |
| Industrial Equipment    | Forklifts                         | C4                       | 120   | U  |  | NHH                         | 783                              | 5.133                     | 0.004                     | 0.000                     | 67                     | 329                  |   |
| Industrial Equipment    | Forklifts                         | C4                       | 175   | U  |  | NHH                         | 59                               | 0.392                     | 0.000                     | 0.000                     | 2                      | 12                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 50    | U  |  | NHH                         | 9                                | 0.094                     | 0.000                     | 0.000                     | 3                      | 13                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 120   | U  |  | NHH                         | 29                               | 0.314                     | 0.000                     | 0.000                     | 4                      | 20                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 175   | U  |  | NHH                         | 52                               | 0.566                     | 0.000                     | 0.000                     | 4                      | 20                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 250   | U  |  | NHH                         | 70                               | 0.773                     | 0.000                     | 0.000                     | 4                      | 20                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 500   | U  |  | NHH                         | 43                               | 0.476                     | 0.000                     | 0.000                     | 2                      | 9                    |   |
| Industrial Equipment    | Other General Industrial Equipmen | G2                       | 15    | U  |  | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Other General Industrial Equipmen | G4                       | 15    | U  |  | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 3                      | 4                    |   |



| Class of Equipment        | Equipment                         | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|---------------------------|-----------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                           |                                   |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 25    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 50    | U                          | NHH                         | 3                                | 0.027                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 120   | U                          | NHH                         | 3                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 175   | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 15    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 25    | U                          | NHH                         | 2                                | 0.020                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 50    | U                          | NHH                         | 3                                | 0.035                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 120   | U                          | NHH                         | 37                               | 0.403                     | 0.000                     | 0.000                     | 3                      | 13                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 175   | U                          | NHH                         | 57                               | 0.624                     | 0.000                     | 0.000                     | 3                      | 13                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 250   | U                          | NHH                         | 79                               | 0.879                     | 0.000                     | 0.000                     | 3                      | 13                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 500   | U                          | NHH                         | 155                              | 1.717                     | 0.000                     | 0.000                     | 3                      | 13                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 750   | U                          | NHH                         | 64                               | 0.707                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 1000  | U                          | NHH                         | 50                               | 0.550                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Industrial Equipment      | Other Material Handling Equipment | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | G4                       | 120   | U                          | NHH                         | 2                                | 0.016                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 50    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 120   | U                          | NHH                         | 1                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 175   | U                          | NHH                         | 3                                | 0.034                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 250   | U                          | NHH                         | 9                                | 0.095                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 500   | U                          | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 9999  | U                          | NHH                         | 2                                | 0.027                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 15    | U                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 25    | U                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 50    | U                          | NHH                         | 11                               | 0.088                     | 0.000                     | 0.000                     | 3                      | 4                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 120   | U                          | NHH                         | 15                               | 0.140                     | 0.000                     | 0.000                     | 2                      | 3                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 25    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 50    | U                          | NHH                         | 18                               | 0.196                     | 0.000                     | 0.000                     | 4                      | 12                   |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 120   | U                          | NHH                         | 70                               | 0.771                     | 0.000                     | 0.000                     | 6                      | 21                   |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 175   | U                          | NHH                         | 60                               | 0.657                     | 0.000                     | 0.000                     | 3                      | 9                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 250   | U                          | NHH                         | 11                               | 0.123                     | 0.000                     | 0.000                     | 0                      | 2                    |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 2     | C                          | HH                          | 20                               | 0.081                     | 0.001                     | 0.000                     | 420                    | 333                  |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 2     | R                          | HH                          | 3                                | 0.015                     | 0.000                     | 0.000                     | 4,721                  | 63                   |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 15    | C                          | HH                          | 34                               | 0.138                     | 0.002                     | 0.000                     | 296                    | 234                  |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 15    | R                          | HH                          | 5                                | 0.026                     | 0.000                     | 0.000                     | 3,326                  | 45                   |   |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2                       | 15    | C                          | HH                          | 42                               | 0.172                     | 0.002                     | 0.000                     | 368                    | 292                  |   |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2                       | 15    | R                          | HH                          | 6                                | 0.033                     | 0.000                     | 0.000                     | 4,140                  | 56                   |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 15    | C                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 15    | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 25    | C                          | NHH                         | 19                               | 0.086                     | 0.000                     | 0.000                     | 4                      | 13                   |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 25    | R                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 7                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 120   | U                          | NHH                         | 6                                | 0.071                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 175   | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 250   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |

| Class of Equipment        | Equipment                     | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------|-------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                           |                               |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D                        | 500   | U                          | NHH                         | 3                                | 0.034                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D                        | 750   | U                          | NHH                         | 8                                | 0.094                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D                        | 1000  | U                          | NHH                         | 23                               | 0.254                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G2                       | 15    | C                          | NHH                         | 5                                | 0.026                     | 0.000                     | 0.000                     | 5                      | 12                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G2                       | 25    | C                          | NHH                         | 5                                | 0.027                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 15    | C                          | NHH                         | 58                               | 0.281                     | 0.000                     | 0.000                     | 49                     | 108                  |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 25    | C                          | NHH                         | 51                               | 0.239                     | 0.000                     | 0.000                     | 24                     | 53                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 50    | U                          | NHH                         | 33                               | 0.238                     | 0.000                     | 0.000                     | 10                     | 20                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 120   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | D                        | 15    | U                          | NHH                         | 4                                | 0.040                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | D                        | 25    | U                          | NHH                         | 104                              | 1.139                     | 0.000                     | 0.000                     | 54                     | 157                  |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 15    | C                          | NHH                         | 14                               | 0.067                     | 0.000                     | 0.000                     | 35                     | 26                   |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 15    | R                          | NHH                         | 46                               | 0.225                     | 0.000                     | 0.000                     | 1,126                  | 87                   |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 25    | C                          | NHH                         | 15                               | 0.069                     | 0.000                     | 0.000                     | 27                     | 20                   |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 25    | R                          | NHH                         | 49                               | 0.230                     | 0.000                     | 0.000                     | 882                    | 68                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 15    | C                          | NHH                         | 31                               | 0.153                     | 0.000                     | 0.000                     | 139                    | 49                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 15    | R                          | NHH                         | 23                               | 0.113                     | 0.000                     | 0.000                     | 905                    | 36                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 25    | C                          | NHH                         | 20                               | 0.093                     | 0.000                     | 0.000                     | 55                     | 19                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 25    | R                          | NHH                         | 15                               | 0.069                     | 0.000                     | 0.000                     | 357                    | 14                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 50    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | D                        | 15    | U                          | NHH                         | 72                               | 0.786                     | 0.000                     | 0.000                     | 114                    | 169                  |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | D                        | 25    | U                          | NHH                         | 86                               | 0.947                     | 0.000                     | 0.000                     | 89                     | 133                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G2                       | 15    | C                          | NHH                         | 17                               | 0.100                     | 0.000                     | 0.000                     | 234                    | 147                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G2                       | 15    | R                          | NHH                         | 9                                | 0.051                     | 0.000                     | 0.000                     | 1,760                  | 75                   |
| Lawn and Garden Equipment | Lawn Mowers                   | G4                       | 5     | C                          | NHH                         | 105                              | 0.592                     | 0.001                     | 0.001                     | 1,388                  | 869                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G4                       | 5     | R                          | NHH                         | 124                              | 0.637                     | 0.001                     | 0.001                     | 21,998                 | 934                  |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G2                       | 2     | C                          | HH                          | 59                               | 0.260                     | 0.003                     | 0.000                     | 2,044                  | 1,099                |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G2                       | 2     | R                          | HH                          | 3                                | 0.016                     | 0.000                     | 0.000                     | 5,269                  | 69                   |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G4                       | 5     | C                          | NHH                         | 1                                | 0.004                     | 0.000                     | 0.000                     | 65                     | 11                   |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G4                       | 5     | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 55                     | 1                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D                        | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 2     | C                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 2     | R                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 71                     | 1                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 15    | C                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 15    | R                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 31                     | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 5     | C                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 43                     | 8                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 5     | R                          | NHH                         | 4                                | 0.017                     | 0.000                     | 0.000                     | 1,327                  | 16                   |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 15    | C                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 19                     | 4                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 15    | R                          | NHH                         | 3                                | 0.015                     | 0.000                     | 0.000                     | 589                    | 7                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 25    | C                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 25    | R                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 13                     | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | D                        | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment         | Equipment                     | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------|-------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                            |                               |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | D                        | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 15    | C                          | NHH                         | 188                              | 0.914                     | 0.000                     | 0.001                     | 760                    | 565                  |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 15    | R                          | NHH                         | 17                               | 0.083                     | 0.000                     | 0.000                     | 666                    | 51                   |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 25    | C                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 25    | R                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 3                      | 0                    |
| Lawn and Garden Equipment  | Shredders                     | G2                       | 15    | C                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 10                     | 4                    |
| Lawn and Garden Equipment  | Shredders                     | G2                       | 15    | R                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 368                    | 1                    |
| Lawn and Garden Equipment  | Shredders                     | G4                       | 5     | C                          | NHH                         | 3                                | 0.015                     | 0.000                     | 0.000                     | 27                     | 10                   |
| Lawn and Garden Equipment  | Shredders                     | G4                       | 5     | R                          | NHH                         | 1                                | 0.004                     | 0.000                     | 0.000                     | 1,017                  | 3                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 15    | C                          | HH                          | 0                                | 0.002                     | 0.000                     | 0.000                     | 16                     | 2                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 15    | R                          | HH                          | 0                                | 0.001                     | 0.000                     | 0.000                     | 147                    | 1                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 25    | C                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 25    | R                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 5     | C                          | NHH                         | 3                                | 0.014                     | 0.000                     | 0.000                     | 176                    | 21                   |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 5     | R                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 1,589                  | 8                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 15    | C                          | NHH                         | 5                                | 0.024                     | 0.000                     | 0.000                     | 134                    | 16                   |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 15    | R                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 1,202                  | 6                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 25    | C                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 25    | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 3                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | D                        | 175   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | D                        | 250   | U                          | NHH                         | 8                                | 0.085                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Lawn and Garden Equipment  | Snowblowers                   | D                        | 500   | U                          | NHH                         | 34                               | 0.378                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Lawn and Garden Equipment  | Tillers                       | G4                       | 5     | C                          | NHH                         | 3                                | 0.017                     | 0.000                     | 0.000                     | 144                    | 22                   |
| Lawn and Garden Equipment  | Tillers                       | G4                       | 5     | R                          | NHH                         | 4                                | 0.021                     | 0.000                     | 0.000                     | 559                    | 28                   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2                       | 2     | C                          | HH                          | 20                               | 0.097                     | 0.001                     | 0.000                     | 1,368                  | 455                  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2                       | 2     | R                          | HH                          | 38                               | 0.191                     | 0.001                     | 0.000                     | 15,254                 | 898                  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4                       | 5     | C                          | NHH                         | 3                                | 0.016                     | 0.000                     | 0.000                     | 253                    | 94                   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4                       | 5     | R                          | NHH                         | 2                                | 0.012                     | 0.000                     | 0.000                     | 1,180                  | 70                   |
| Lawn and Garden Equipment  | Wood Splitters                | G4                       | 5     | C                          | NHH                         | 5                                | 0.027                     | 0.000                     | 0.000                     | 47                     | 16                   |
| Lawn and Garden Equipment  | Wood Splitters                | G4                       | 5     | R                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 1,169                  | 4                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 5     | C                          | NHH                         | 10                               | 0.059                     | 0.000                     | 0.000                     | 29                     | 45                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 5     | R                          | NHH                         | 5                                | 0.031                     | 0.000                     | 0.000                     | 23                     | 24                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 15    | C                          | NHH                         | 9                                | 0.042                     | 0.000                     | 0.000                     | 15                     | 23                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 15    | R                          | NHH                         | 5                                | 0.022                     | 0.000                     | 0.000                     | 11                     | 12                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 25    | C                          | NHH                         | 3                                | 0.014                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 25    | R                          | NHH                         | 2                                | 0.007                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 50    | U                          | NHH                         | 10                               | 0.075                     | 0.000                     | 0.000                     | 3                      | 4                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 120   | U                          | NHH                         | 54                               | 0.482                     | 0.000                     | 0.000                     | 11                     | 14                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 175   | U                          | NHH                         | 7                                | 0.060                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Air Compressors               | D                        | 15    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Air Compressors               | D                        | 25    | U                          | NHH                         | 1                                | 0.013                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Light Commercial Equipment | Air Compressors               | D                        | 50    | U                          | NHH                         | 17                               | 0.186                     | 0.000                     | 0.000                     | 7                      | 17                   |
| Light Commercial Equipment | Air Compressors               | D                        | 120   | U                          | NHH                         | 237                              | 2.606                     | 0.000                     | 0.000                     | 50                     | 111                  |
| Light Commercial Equipment | Air Compressors               | D                        | 175   | U                          | NHH                         | 17                               | 0.186                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Light Commercial Equipment | Air Compressors               | D                        | 250   | U                          | NHH                         | 35                               | 0.388                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Light Commercial Equipment | Air Compressors               | D                        | 500   | U                          | NHH                         | 81                               | 0.894                     | 0.000                     | 0.000                     | 3                      | 8                    |


| Class of Equipment         | Equipment        | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |     | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------|------------------|--------------------------|-------|--|-----|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                            |                  |                          |       |  |     |                             |                                  |                           |                           |                           |                        |                      |
| Light Commercial Equipment | Air Compressors  | D                        | 750   | U  | NHH |                             | 47                               | 0.517                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Light Commercial Equipment | Air Compressors  | D                        | 1000  | U  | NHH |                             | 2                                | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Gas Compressors  | C4                       | 50    | U  | NHH |                             | 20                               | 0.135                     | 0.000                     | 0.000                     | 0                      | 6                    |
| Light Commercial Equipment | Gas Compressors  | C4                       | 120   | U  | NHH |                             | 115                              | 0.758                     | 0.001                     | 0.000                     | 1                      | 12                   |
| Light Commercial Equipment | Gas Compressors  | C4                       | 175   | U  | NHH |                             | 29                               | 0.197                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Light Commercial Equipment | Gas Compressors  | C4                       | 250   | U  | NHH |                             | 31                               | 0.203                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Light Commercial Equipment | Gas Compressors  | C4                       | 500   | U  | NHH |                             | 43                               | 0.286                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Generator Sets   | G2                       | 2     | C  | NHH |                             | 0                                | 0.002                     | 0.000                     | 0.000                     | 17                     | 6                    |
| Light Commercial Equipment | Generator Sets   | G2                       | 2     | R  | NHH |                             | 0                                | 0.001                     | 0.000                     | 0.000                     | 13                     | 3                    |
| Light Commercial Equipment | Generator Sets   | G2                       | 15    | C  | NHH |                             | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Generator Sets   | G2                       | 15    | R  | NHH |                             | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Generator Sets   | G4                       | 5     | C  | NHH |                             | 18                               | 0.106                     | 0.000                     | 0.000                     | 225                    | 83                   |
| Light Commercial Equipment | Generator Sets   | G4                       | 5     | R  | NHH |                             | 10                               | 0.056                     | 0.000                     | 0.000                     | 176                    | 44                   |
| Light Commercial Equipment | Generator Sets   | G4                       | 15    | C  | NHH |                             | 136                              | 0.657                     | 0.000                     | 0.001                     | 617                    | 227                  |
| Light Commercial Equipment | Generator Sets   | G4                       | 15    | R  | NHH |                             | 72                               | 0.347                     | 0.000                     | 0.000                     | 485                    | 120                  |
| Light Commercial Equipment | Generator Sets   | G4                       | 25    | C  | NHH |                             | 158                              | 0.746                     | 0.000                     | 0.000                     | 331                    | 122                  |
| Light Commercial Equipment | Generator Sets   | G4                       | 25    | R  | NHH |                             | 84                               | 0.394                     | 0.000                     | 0.000                     | 260                    | 64                   |
| Light Commercial Equipment | Generator Sets   | G4                       | 50    | U  | NHH |                             | 77                               | 0.652                     | 0.000                     | 0.000                     | 110                    | 35                   |
| Light Commercial Equipment | Generator Sets   | G4                       | 120   | U  | NHH |                             | 35                               | 0.323                     | 0.000                     | 0.000                     | 21                     | 7                    |
| Light Commercial Equipment | Generator Sets   | G4                       | 175   | U  | NHH |                             | 6                                | 0.052                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Light Commercial Equipment | Generator Sets   | C4                       | 120   | U  | NHH |                             | 3                                | 0.021                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Light Commercial Equipment | Generator Sets   | C4                       | 175   | U  | NHH |                             | 5                                | 0.031                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Light Commercial Equipment | Generator Sets   | D                        | 15    | U  | NHH |                             | 18                               | 0.192                     | 0.000                     | 0.000                     | 41                     | 38                   |
| Light Commercial Equipment | Generator Sets   | D                        | 25    | U  | NHH |                             | 22                               | 0.242                     | 0.000                     | 0.000                     | 30                     | 28                   |
| Light Commercial Equipment | Generator Sets   | D                        | 50    | U  | NHH |                             | 47                               | 0.514                     | 0.000                     | 0.000                     | 36                     | 34                   |
| Light Commercial Equipment | Generator Sets   | D                        | 120   | U  | NHH |                             | 181                              | 1.987                     | 0.000                     | 0.000                     | 55                     | 51                   |
| Light Commercial Equipment | Generator Sets   | D                        | 175   | U  | NHH |                             | 19                               | 0.214                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Light Commercial Equipment | Generator Sets   | D                        | 250   | U  | NHH |                             | 16                               | 0.179                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Light Commercial Equipment | Generator Sets   | D                        | 500   | U  | NHH |                             | 57                               | 0.631                     | 0.000                     | 0.000                     | 4                      | 4                    |
| Light Commercial Equipment | Generator Sets   | D                        | 750   | U  | NHH |                             | 57                               | 0.633                     | 0.000                     | 0.000                     | 3                      | 2                    |
| Light Commercial Equipment | Generator Sets   | D                        | 9999  | U  | NHH |                             | 29                               | 0.318                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Pressure Washers | G4                       | 5     | C  | NHH |                             | 8                                | 0.045                     | 0.000                     | 0.000                     | 60                     | 22                   |
| Light Commercial Equipment | Pressure Washers | G4                       | 5     | R  | NHH |                             | 4                                | 0.024                     | 0.000                     | 0.000                     | 47                     | 12                   |
| Light Commercial Equipment | Pressure Washers | G4                       | 15    | C  | NHH |                             | 12                               | 0.056                     | 0.000                     | 0.000                     | 54                     | 20                   |
| Light Commercial Equipment | Pressure Washers | G4                       | 15    | R  | NHH |                             | 6                                | 0.029                     | 0.000                     | 0.000                     | 42                     | 10                   |
| Light Commercial Equipment | Pressure Washers | G4                       | 25    | C  | NHH |                             | 6                                | 0.027                     | 0.000                     | 0.000                     | 10                     | 4                    |
| Light Commercial Equipment | Pressure Washers | G4                       | 25    | R  | NHH |                             | 3                                | 0.014                     | 0.000                     | 0.000                     | 8                      | 2                    |
| Light Commercial Equipment | Pressure Washers | G4                       | 50    | U  | NHH |                             | 1                                | 0.007                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Light Commercial Equipment | Pressure Washers | D                        | 15    | U  | NHH |                             | 0                                | 0.002                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Light Commercial Equipment | Pressure Washers | D                        | 25    | U  | NHH |                             | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Pressure Washers | D                        | 50    | U  | NHH |                             | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Light Commercial Equipment | Pressure Washers | D                        | 120   | U  | NHH |                             | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Pumps            | G2                       | 2     | C  | NHH |                             | 2                                | 0.016                     | 0.000                     | 0.000                     | 68                     | 48                   |
| Light Commercial Equipment | Pumps            | G2                       | 2     | R  | NHH |                             | 1                                | 0.008                     | 0.000                     | 0.000                     | 53                     | 25                   |
| Light Commercial Equipment | Pumps            | G2                       | 15    | C  | NHH |                             | 7                                | 0.034                     | 0.000                     | 0.000                     | 18                     | 13                   |
| Light Commercial Equipment | Pumps            | G2                       | 15    | R  | NHH |                             | 3                                | 0.018                     | 0.000                     | 0.000                     | 14                     | 7                    |






| Class of Equipment              | Equipment        | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |  | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|---------------------------------|------------------|--------------------------|-------|--|--|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
|                                 |                  |                          |       |  |  |                             |                                  |                           |                           |                           |                        |                      |  |
| Light Commercial Equipment      | Pumps            | G2                       | 25    | C  |  | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps            | G2                       | 25    | R  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps            | G4                       | 5     | C  |  | NHH                         | 9                                | 0.055                     | 0.000                     | 0.000                     | 80                     | 56                   |  |
| Light Commercial Equipment      | Pumps            | G4                       | 5     | R  |  | NHH                         | 5                                | 0.029                     | 0.000                     | 0.000                     | 63                     | 30                   |  |
| Light Commercial Equipment      | Pumps            | G4                       | 15    | C  |  | NHH                         | 33                               | 0.159                     | 0.000                     | 0.000                     | 86                     | 61                   |  |
| Light Commercial Equipment      | Pumps            | G4                       | 15    | R  |  | NHH                         | 18                               | 0.084                     | 0.000                     | 0.000                     | 68                     | 32                   |  |
| Light Commercial Equipment      | Pumps            | G4                       | 25    | C  |  | NHH                         | 19                               | 0.087                     | 0.000                     | 0.000                     | 22                     | 16                   |  |
| Light Commercial Equipment      | Pumps            | G4                       | 25    | R  |  | NHH                         | 10                               | 0.046                     | 0.000                     | 0.000                     | 17                     | 8                    |  |
| Light Commercial Equipment      | Pumps            | G4                       | 50    | U  |  | NHH                         | 12                               | 0.098                     | 0.000                     | 0.000                     | 9                      | 5                    |  |
| Light Commercial Equipment      | Pumps            | G4                       | 120   | U  |  | NHH                         | 40                               | 0.370                     | 0.000                     | 0.000                     | 11                     | 7                    |  |
| Light Commercial Equipment      | Pumps            | G4                       | 175   | U  |  | NHH                         | 2                                | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps            | D                        | 15    | U  |  | NHH                         | 11                               | 0.125                     | 0.000                     | 0.000                     | 31                     | 34                   |  |
| Light Commercial Equipment      | Pumps            | D                        | 25    | U  |  | NHH                         | 9                                | 0.098                     | 0.000                     | 0.000                     | 9                      | 10                   |  |
| Light Commercial Equipment      | Pumps            | D                        | 50    | U  |  | NHH                         | 27                               | 0.301                     | 0.000                     | 0.000                     | 16                     | 18                   |  |
| Light Commercial Equipment      | Pumps            | D                        | 120   | U  |  | NHH                         | 122                              | 1.339                     | 0.000                     | 0.000                     | 31                     | 34                   |  |
| Light Commercial Equipment      | Pumps            | D                        | 175   | U  |  | NHH                         | 24                               | 0.260                     | 0.000                     | 0.000                     | 3                      | 4                    |  |
| Light Commercial Equipment      | Pumps            | D                        | 250   | U  |  | NHH                         | 24                               | 0.270                     | 0.000                     | 0.000                     | 2                      | 3                    |  |
| Light Commercial Equipment      | Pumps            | D                        | 500   | U  |  | NHH                         | 1                                | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps            | D                        | 750   | U  |  | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps            | D                        | 9999  | U  |  | NHH                         | 12                               | 0.131                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Welders          | G4                       | 15    | C  |  | NHH                         | 18                               | 0.085                     | 0.000                     | 0.000                     | 56                     | 32                   |  |
| Light Commercial Equipment      | Welders          | G4                       | 25    | C  |  | NHH                         | 102                              | 0.475                     | 0.000                     | 0.000                     | 203                    | 116                  |  |
| Light Commercial Equipment      | Welders          | G4                       | 50    | U  |  | NHH                         | 24                               | 0.198                     | 0.000                     | 0.000                     | 18                     | 10                   |  |
| Light Commercial Equipment      | Welders          | G4                       | 120   | U  |  | NHH                         | 34                               | 0.310                     | 0.000                     | 0.000                     | 18                     | 10                   |  |
| Light Commercial Equipment      | Welders          | G4                       | 175   | U  |  | NHH                         | 4                                | 0.039                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Light Commercial Equipment      | Welders          | D                        | 15    | U  |  | NHH                         | 7                                | 0.075                     | 0.000                     | 0.000                     | 14                     | 24                   |  |
| Light Commercial Equipment      | Welders          | D                        | 25    | U  |  | NHH                         | 11                               | 0.121                     | 0.000                     | 0.000                     | 12                     | 21                   |  |
| Light Commercial Equipment      | Welders          | D                        | 50    | U  |  | NHH                         | 78                               | 0.853                     | 0.000                     | 0.000                     | 37                     | 66                   |  |
| Light Commercial Equipment      | Welders          | D                        | 120   | U  |  | NHH                         | 92                               | 1.008                     | 0.000                     | 0.000                     | 29                     | 51                   |  |
| Light Commercial Equipment      | Welders          | D                        | 175   | U  |  | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Welders          | D                        | 250   | U  |  | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Welders          | D                        | 500   | U  |  | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Logging Equipment               | Chainsaws        | G2                       | 15    | U  |  | HH                          | 358                              | 1.515                     | 0.017                     | 0.001                     | 770                    | 435                  |  |
| Logging Equipment               | Fellers/Bunchers | D                        | 120   | U  |  | NHH                         | 1,427                            | 15.666                    | 0.001                     | 0.000                     | 98                     | 342                  |  |
| Logging Equipment               | Fellers/Bunchers | D                        | 175   | U  |  | NHH                         | 2,601                            | 28.595                    | 0.001                     | 0.000                     | 121                    | 423                  |  |
| Logging Equipment               | Fellers/Bunchers | D                        | 250   | U  |  | NHH                         | 2,273                            | 25.137                    | 0.001                     | 0.000                     | 74                     | 258                  |  |
| Logging Equipment               | Fellers/Bunchers | D                        | 500   | U  |  | NHH                         | 1,003                            | 11.092                    | 0.000                     | 0.000                     | 22                     | 76                   |  |
| Logging Equipment               | Fellers/Bunchers | D                        | 750   | U  |  | NHH                         | 152                              | 1.681                     | 0.000                     | 0.000                     | 2                      | 6                    |  |
| Logging Equipment               | Shredders        | G4                       | 15    | U  |  | NHH                         | 505                              | 2.429                     | 0.002                     | 0.002                     | 1,208                  | 802                  |  |
| Logging Equipment               | Shredders        | D                        | 175   | U  |  | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Logging Equipment               | Skidders         | D                        | 120   | U  |  | NHH                         | 766                              | 8.410                     | 0.000                     | 0.000                     | 45                     | 178                  |  |
| Logging Equipment               | Skidders         | D                        | 175   | U  |  | NHH                         | 1,811                            | 19.911                    | 0.001                     | 0.000                     | 72                     | 284                  |  |
| Logging Equipment               | Skidders         | D                        | 250   | U  |  | NHH                         | 996                              | 11.009                    | 0.000                     | 0.000                     | 26                     | 105                  |  |
| Logging Equipment               | Skidders         | D                        | 500   | U  |  | NHH                         | 67                               | 0.737                     | 0.000                     | 0.000                     | 1                      | 6                    |  |
| Military Tactical Support Equip | A/C unit         | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | A/C unit         | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |



| Class of Equipment              | Equipment                        | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|---------------------------------|----------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                                 |                                  |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Military Tactical Support Equip | A/C unit                         | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Aircraft Support                 | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Aircraft Support                 | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Cart                             | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Cart                             | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Cart                             | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Communications                   | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Communications                   | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Crane                            | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Crane                            | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Crane                            | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Deicer                           | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Generator (Military)             | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Generator (Military)             | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Generator (Military)             | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Generator (Military)             | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Generator (Military)             | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Generator (Military)             | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Hydraulic unit                   | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Lift (Military)                  | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Light                            | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Pressure Washers                 | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Pump (Military)                  | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Pump (Military)                  | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Start Cart                       | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Start Cart                       | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Test Stand                       | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Test Stand                       | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Test Stand                       | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Test Stand                       | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Welder                           | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | Welder                           | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling                    | Compressors (Workover)           | D                        | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling                    | Compressors (Workover)           | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling                    | Compressors (Workover)           | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |

| Class of Equipment | Equipment                | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |  | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|--------------------|--------------------------|--------------------------|-------|--|--|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                    |                          |                          |       |  |  |                             |                                  |                           |                           |                           |                        |                      |
| Oil Drilling       | Compressors (Workover)   | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Compressors (Workover)   | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Compressors (Workover)   | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Compressors (Workover)   | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 50    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 50    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pressure Washers         | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |





| Class of Equipment       | Equipment                         | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|--------------------------|-----------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                          |                                   |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Oil Drilling             | Pump (Workover)                   | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                   | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                   | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                   | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                   | D                        | 9999  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Snubbing                          | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                            | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                            | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                            | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                            | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)             | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)             | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)             | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)             | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)             | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)             | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)             | D                        | 1000  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment           | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment           | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment           | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment           | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment           | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment           | D                        | 1000  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Pleasure Craft           | Personal Water Craft              | G2                       | 9999  | U                          | NHH                         | 21,836                           | 195.001                   | 0.147                     | 0.040                     | 87,172                 | 5,872                |   |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine | G4                       | 15    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 92                     | 3                    |   |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin | G2                       | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 60                     | 2                    |   |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin | G2                       | 25    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 32                     | 1                    |   |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin | G2                       | 50    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 30                     | 1                    |   |
| Pleasure Craft           | Vessels w/Inboard Engines         | G4                       | 250   | U                          | NHH                         | 12,352                           | 96.009                    | 0.018                     | 0.015                     | 8,919                  | 2,266                |   |
| Pleasure Craft           | Vessels w/Inboard Engines         | D                        | 250   | U                          | NHH                         | 4                                | 0.044                     | 0.000                     | 0.000                     | 3                      | 1                    |   |
| Pleasure Craft           | Vessels w/Inboard Jet Engines     | G4                       | 500   | U                          | NHH                         | 1,776                            | 13.851                    | 0.002                     | 0.002                     | 1,380                  | 275                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 2     | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 124                    | 16                   |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 15    | U                          | NHH                         | 110                              | 0.820                     | 0.002                     | 0.001                     | 6,882                  | 903                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 25    | U                          | NHH                         | 94                               | 0.743                     | 0.001                     | 0.000                     | 1,870                  | 245                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 50    | U                          | NHH                         | 277                              | 2.448                     | 0.002                     | 0.001                     | 1,826                  | 239                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 120   | U                          | NHH                         | 513                              | 4.545                     | 0.004                     | 0.001                     | 1,606                  | 211                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 175   | U                          | NHH                         | 425                              | 3.746                     | 0.003                     | 0.001                     | 741                    | 97                   |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 250   | U                          | NHH                         | 158                              | 1.413                     | 0.001                     | 0.000                     | 213                    | 28                   |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G2                       | 500   | U                          | NHH                         | 46                               | 0.399                     | 0.000                     | 0.000                     | 43                     | 6                    |   |
| Pleasure Craft           | Vessels w/Outboard Engines        | G4                       | 50    | U                          | NHH                         | 115                              | 0.777                     | 0.000                     | 0.000                     | 637                    | 84                   |   |
| Pleasure Craft           | Vessels w/Sterndrive Engines      | G4                       | 250   | U                          | NHH                         | 14,515                           | 113.481                   | 0.020                     | 0.020                     | 18,149                 | 3,620                |   |
| Railyard Operations      | Compressor (Railyard)             | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Railyard Operations      | Crane (Rail-CHE)                  | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Railyard Operations      | Crane (Rail-CHE)                  | D                        | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Railyard Operations      | Generator (Railyard)              | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |

| Class of Equipment            | Equipment                            | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-------------------------------|--------------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                               |                                      |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Railyard Operations           | Generator (Railyard)                 | D                        | 9999  | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Railyard Operations           | Materials Handling (Rail-CHE)        | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2                       | 15    | U                          | NHH                         | 119                              | 0.397                     | 0.007                     | 0.000                     | 847                    | 3,136                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2                       | 25    | U                          | NHH                         | 77                               | 0.259                     | 0.005                     | 0.000                     | 551                    | 2,042                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2                       | 50    | U                          | NHH                         | 102                              | 0.340                     | 0.006                     | 0.000                     | 726                    | 2,687                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4                       | 15    | U                          | NHH                         | 48                               | 0.324                     | 0.000                     | 0.001                     | 691                    | 2,559                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4                       | 25    | U                          | NHH                         | 673                              | 4.510                     | 0.003                     | 0.014                     | 9,617                  | 35,607               |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4                       | 50    | U                          | NHH                         | 30                               | 0.204                     | 0.000                     | 0.001                     | 434                    | 1,607                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 257                    | 952                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 167                    | 620                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 220                    | 816                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 210                    | 777                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 2,920                  | 10,809               |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 132                    | 488                  |
| Recreational Equipment        | Golf Carts                           | G2                       | 15    | U                          | NHH                         | 562                              | 2.924                     | 0.002                     | 0.003                     | 494                    | 1,492                |
| Recreational Equipment        | Golf Carts                           | G4                       | 15    | U                          | NHH                         | 474                              | 2.288                     | 0.001                     | 0.002                     | 386                    | 1,168                |
| Recreational Equipment        | Minibikes                            | G4                       | 5     | U                          | NHH                         | 15                               | 0.008                     | 0.001                     | 0.000                     | 172                    | 65                   |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 15    | U                          | NHH                         | 81                               | 0.272                     | 0.005                     | 0.000                     | 580                    | 2,148                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 25    | U                          | NHH                         | 70                               | 0.234                     | 0.004                     | 0.000                     | 499                    | 1,849                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 50    | U                          | NHH                         | 570                              | 1.906                     | 0.036                     | 0.001                     | 4,065                  | 15,049               |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 120   | U                          | NHH                         | 273                              | 0.912                     | 0.017                     | 0.000                     | 1,944                  | 7,199                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4                       | 15    | U                          | NHH                         | 79                               | 0.531                     | 0.000                     | 0.001                     | 1,132                  | 4,189                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4                       | 25    | U                          | NHH                         | 127                              | 0.856                     | 0.001                     | 0.002                     | 1,826                  | 6,759                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4                       | 50    | U                          | NHH                         | 132                              | 0.892                     | 0.001                     | 0.002                     | 1,902                  | 7,041                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 232                    | 861                  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 200                    | 741                  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 1,628                  | 6,028                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 779                    | 2,884                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 453                    | 1,678                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 731                    | 2,707                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 762                    | 2,821                |
| Recreational Equipment        | Snowmobiles Active                   | G2                       | 25    | U                          | NHH                         | 17                               | 0.077                     | 0.001                     | 0.000                     | 153                    | 24                   |
| Recreational Equipment        | Snowmobiles Active                   | G2                       | 50    | U                          | NHH                         | 154                              | 0.694                     | 0.005                     | 0.001                     | 720                    | 113                  |
| Recreational Equipment        | Snowmobiles Active                   | G2                       | 120   | U                          | NHH                         | 479                              | 2.158                     | 0.016                     | 0.001                     | 1,309                  | 206                  |
| Recreational Equipment        | Snowmobiles Inactive                 | G2                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 53                     | 8                    |
| Recreational Equipment        | Snowmobiles Inactive                 | G2                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 251                    | 39                   |
| Recreational Equipment        | Snowmobiles Inactive                 | G2                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 456                    | 72                   |
| Recreational Equipment        | Specialty Vehicles Carts             | G2                       | 15    | U                          | NHH                         | 75                               | 0.393                     | 0.000                     | 0.000                     | 1,125                  | 205                  |
| Recreational Equipment        | Specialty Vehicles Carts             | G4                       | 5     | U                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 35                     | 6                    |
| Recreational Equipment        | Specialty Vehicles Carts             | G4                       | 15    | U                          | NHH                         | 34                               | 0.165                     | 0.000                     | 0.000                     | 472                    | 86                   |
| Recreational Equipment        | Specialty Vehicles Carts             | G4                       | 25    | U                          | NHH                         | 52                               | 0.246                     | 0.000                     | 0.000                     | 259                    | 47                   |
| Transport Refrigeration Units | Transport Refrigeration Units        | G4                       | 15    | U                          | NHH                         | 104                              | 0.505                     | 0.000                     | 0.000                     | 86                     | 178                  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D                        | 15    | U                          | NHH                         | 357                              | 3.906                     | 0.000                     | 0.000                     | 342                    | 974                  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D                        | 25    | U                          | NHH                         | 141                              | 1.545                     | 0.000                     | 0.000                     | 80                     | 227                  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D                        | 50    | U                          | NHH                         | 14,260                           | 155.937                   | 0.011                     | 0.000                     | 2,995                  | 12,043               |






| Class of Equipment     | Equipment                    | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|------------------------|------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                        |                              |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Agricultural Equipment | 2-Wheel Tractors             | G4                       | 5     | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 9                      | 4                    |   |
| Agricultural Equipment | 2-Wheel Tractors             | G4                       | 15    | U                          | NHH                         | 5                                | 0.022                     | 0.000                     | 0.000                     | 10                     | 9                    |   |
| Agricultural Equipment | 2-Wheel Tractors             | G4                       | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Agricultural Mowers          | G4                       | 15    | U                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 9                      | 5                    |   |
| Agricultural Equipment | Agricultural Mowers          | G4                       | 25    | U                          | NHH                         | 3                                | 0.015                     | 0.000                     | 0.000                     | 8                      | 4                    |   |
| Agricultural Equipment | Agricultural Mowers          | D                        | 120   | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Agricultural Tractors        | G4                       | 120   | U                          | NHH                         | 25                               | 0.218                     | 0.000                     | 0.000                     | 3                      | 5                    |   |
| Agricultural Equipment | Agricultural Tractors        | G4                       | 175   | U                          | NHH                         | 5                                | 0.044                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Agricultural Equipment | Agricultural Tractors        | D                        | 15    | U                          | NHH                         | 74                               | 0.807                     | 0.000                     | 0.000                     | 105                    | 153                  |   |
| Agricultural Equipment | Agricultural Tractors        | D                        | 25    | U                          | NHH                         | 174                              | 1.907                     | 0.000                     | 0.000                     | 130                    | 189                  |   |
| Agricultural Equipment | Agricultural Tractors        | D                        | 50    | U                          | NHH                         | 617                              | 6.731                     | 0.001                     | 0.000                     | 302                    | 394                  |   |
| Agricultural Equipment | Agricultural Tractors        | D                        | 120   | U                          | NHH                         | 1,511                            | 16.567                    | 0.001                     | 0.000                     | 349                    | 455                  |   |
| Agricultural Equipment | Agricultural Tractors        | D                        | 175   | U                          | NHH                         | 1,453                            | 15.963                    | 0.001                     | 0.000                     | 197                    | 256                  |   |
| Agricultural Equipment | Agricultural Tractors        | D                        | 250   | U                          | NHH                         | 1,333                            | 14.740                    | 0.001                     | 0.000                     | 127                    | 166                  |   |
| Agricultural Equipment | Agricultural Tractors        | D                        | 500   | U                          | NHH                         | 433                              | 4.788                     | 0.000                     | 0.000                     | 25                     | 33                   |   |
| Agricultural Equipment | Balers                       | G4                       | 50    | U                          | NHH                         | 4                                | 0.038                     | 0.000                     | 0.000                     | 12                     | 2                    |   |
| Agricultural Equipment | Balers                       | G4                       | 120   | U                          | NHH                         | 4                                | 0.035                     | 0.000                     | 0.000                     | 6                      | 1                    |   |
| Agricultural Equipment | Balers                       | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Balers                       | D                        | 120   | U                          | NHH                         | 6                                | 0.070                     | 0.000                     | 0.000                     | 10                     | 3                    |   |
| Agricultural Equipment | Combines                     | G4                       | 120   | U                          | NHH                         | 2                                | 0.019                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Agricultural Equipment | Combines                     | G4                       | 175   | U                          | NHH                         | 2                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Combines                     | G4                       | 250   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Combines                     | D                        | 120   | U                          | NHH                         | 13                               | 0.144                     | 0.000                     | 0.000                     | 7                      | 3                    |   |
| Agricultural Equipment | Combines                     | D                        | 175   | U                          | NHH                         | 25                               | 0.280                     | 0.000                     | 0.000                     | 11                     | 5                    |   |
| Agricultural Equipment | Combines                     | D                        | 250   | U                          | NHH                         | 38                               | 0.422                     | 0.000                     | 0.000                     | 12                     | 5                    |   |
| Agricultural Equipment | Combines                     | D                        | 500   | U                          | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Hydro Power Units            | G4                       | 5     | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Agricultural Equipment | Hydro Power Units            | G4                       | 15    | U                          | NHH                         | 2                                | 0.011                     | 0.000                     | 0.000                     | 4                      | 5                    |   |
| Agricultural Equipment | Hydro Power Units            | G4                       | 25    | U                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 2                      | 2                    |   |
| Agricultural Equipment | Hydro Power Units            | G4                       | 50    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Hydro Power Units            | G4                       | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Hydro Power Units            | D                        | 15    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Agricultural Equipment | Hydro Power Units            | D                        | 25    | U                          | NHH                         | 1                                | 0.016                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Agricultural Equipment | Hydro Power Units            | D                        | 50    | U                          | NHH                         | 3                                | 0.031                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Agricultural Equipment | Hydro Power Units            | D                        | 120   | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 5     | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 50    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 120   | U                          | NHH                         | 3                                | 0.023                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 175   | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Other Agricultural Equipment | G4                       | 250   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 15    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 25    | U                          | NHH                         | 3                                | 0.035                     | 0.000                     | 0.000                     | 4                      | 5                    |   |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 50    | U                          | NHH                         | 4                                | 0.048                     | 0.000                     | 0.000                     | 4                      | 4                    |   |
| Agricultural Equipment | Other Agricultural Equipment | D                        | 120   | U                          | NHH                         | 30                               | 0.325                     | 0.000                     | 0.000                     | 12                     | 13                   |   |


| Class of Equipment               | Equipment                    | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|----------------------------------|------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                                  |                              |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Agricultural Equipment           | Other Agricultural Equipment | D                        | 175   | U                          | NHH                         | 4                                | 0.049                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Agricultural Equipment           | Other Agricultural Equipment | D                        | 250   | U                          | NHH                         | 6                                | 0.071                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Agricultural Equipment           | Other Agricultural Equipment | D                        | 500   | U                          | NHH                         | 2                                | 0.025                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 5     | U                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 35                     | 9                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 15    | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 11                     | 3                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 25    | U                          | NHH                         | 7                                | 0.030                     | 0.000                     | 0.000                     | 28                     | 8                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 50    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 120   | U                          | NHH                         | 3                                | 0.025                     | 0.000                     | 0.000                     | 4                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | G4                       | 175   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 25    | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 50    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 120   | U                          | NHH                         | 3                                | 0.033                     | 0.000                     | 0.000                     | 5                      | 1                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 175   | U                          | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 2                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 250   | U                          | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Agricultural Equipment           | Sprayers                     | D                        | 500   | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Swathers                     | G4                       | 120   | U                          | NHH                         | 14                               | 0.127                     | 0.000                     | 0.000                     | 12                     | 3                    |   |
| Agricultural Equipment           | Swathers                     | G4                       | 175   | U                          | NHH                         | 15                               | 0.138                     | 0.000                     | 0.000                     | 10                     | 2                    |   |
| Agricultural Equipment           | Swathers                     | D                        | 120   | U                          | NHH                         | 39                               | 0.431                     | 0.000                     | 0.000                     | 53                     | 16                   |   |
| Agricultural Equipment           | Swathers                     | D                        | 175   | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Tillers                      | G4                       | 15    | U                          | NHH                         | 113                              | 0.544                     | 0.000                     | 0.000                     | 1,187                  | 231                  |   |
| Agricultural Equipment           | Tillers                      | D                        | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Tillers                      | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Agricultural Equipment           | Tillers                      | D                        | 500   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | A/C Tug Narrow Body          | G4                       | 175   | U                          | NHH                         | 2                                | 0.014                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | A/C Tug Narrow Body          | D                        | 250   | U                          | NHH                         | 5                                | 0.057                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Airport Ground Support Equipment | A/C Tug Wide Body            | G4                       | 500   | U                          | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | A/C Tug Wide Body            | D                        | 500   | U                          | NHH                         | 3                                | 0.032                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | G4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | C4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | D                        | 175   | U                          | NHH                         | 1                                | 0.010                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | D                        | 250   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Conditioner              | D                        | 500   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | G4                       | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 500   | U                          | NHH                         | 3                                | 0.036                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Air Start Unit               | D                        | 750   | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Baggage Tug                  | G4                       | 120   | U                          | NHH                         | 14                               | 0.125                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Airport Ground Support Equipment | Baggage Tug                  | C4                       | 120   | U                          | NHH                         | 3                                | 0.021                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Airport Ground Support Equipment | Baggage Tug                  | D                        | 120   | U                          | NHH                         | 6                                | 0.070                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Airport Ground Support Equipment | Belt Loader                  | G4                       | 120   | U                          | NHH                         | 3                                | 0.030                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Airport Ground Support Equipment | Belt Loader                  | C4                       | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Belt Loader                  | D                        | 120   | U                          | NHH                         | 2                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Airport Ground Support Equipment | Bobtail                      | G4                       | 120   | U                          | NHH                         | 2                                | 0.020                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Bobtail                      | C4                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment | Bobtail                      | D                        | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |

| Class of Equipment               | Equipment         | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|----------------------------------|-------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
|                                  |                   |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |  |
| Airport Ground Support Equipment | Cargo Loader      | G4                       | 120   | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cargo Loader      | C4                       | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cargo Loader      | D                        | 120   | U                          | NHH                         | 3                                | 0.035                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Cargo Tractor     | G4                       | 120   | U                          | NHH                         | 17                               | 0.140                     | 0.000                     | 0.000                     | 1                      | 3                    |  |
| Airport Ground Support Equipment | Cargo Tractor     | C4                       | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cargo Tractor     | D                        | 120   | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Cart              | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Catering Truck    | G4                       | 250   | U                          | NHH                         | 3                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Catering Truck    | C4                       | 250   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Catering Truck    | D                        | 250   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 500   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Compressor (GSE)  | D                        | 750   | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Deicer            | G4                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Forklift          | G4                       | 50    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Forklift          | C4                       | 50    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Forklift          | D                        | 175   | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Fuel Truck        | G4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Fuel Truck        | C4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Fuel Truck        | D                        | 250   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | G4                       | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 120   | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 175   | U                          | NHH                         | 4                                | 0.044                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 250   | U                          | NHH                         | 6                                | 0.066                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 500   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Generator         | D                        | 750   | U                          | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Ground Power Unit | G4                       | 175   | U                          | NHH                         | 2                                | 0.021                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Ground Power Unit | D                        | 175   | U                          | NHH                         | 9                                | 0.100                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Airport Ground Support Equipment | Hydrant truck     | G4                       | 175   | U                          | NHH                         | 3                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Hydrant Truck     | D                        | 175   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lav Cart          | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lav Truck         | G4                       | 175   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lav Truck         | C4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lav Truck         | D                        | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lift              | G4                       | 120   | U                          | NHH                         | 1                                | 0.010                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lift              | C4                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Lift              | D                        | 120   | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Maint. Truck      | G4                       | 175   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Other             | C4                       | 50    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Other GSE         | G4                       | 50    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Other GSE         | D                        | 175   | U                          | NHH                         | 1                                | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Passenger Stand   | G4                       | 175   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Passenger Stand   | C4                       | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Passenger Stand   | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Airport Ground Support Equipment | Service Truck     | G4                       | 250   | U                          | NHH                         | 3                                | 0.031                     | 0.000                     | 0.000                     | 0                      | 1                    |  |





| Class of Equipment                | Equipment                | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|-----------------------------------|--------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                                   |                          |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Airport Ground Support Equipment  | Service Truck            | C4                       | 250   | U                          | NHH                         | 1                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Service Truck            | D                        | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Sweeper                  | G4                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Sweeper                  | C4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Sweeper                  | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Airport Ground Support Equipment  | Water Truck              | G4                       | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 25    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 50    | U                          | NHH                         | 1                                | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Asphalt Pavers           | G4                       | 120   | U                          | NHH                         | 1                                | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 25    | U                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 50    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 120   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | G4                       | 175   | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 25    | U                          | NHH                         | 0                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 50    | U                          | NHH                         | 4                                | 0.042                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 120   | U                          | NHH                         | 29                               | 0.317                     | 0.000                     | 0.000                     | 4                      | 8                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 175   | U                          | NHH                         | 12                               | 0.134                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 250   | U                          | NHH                         | 14                               | 0.154                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 500   | U                          | NHH                         | 51                               | 0.566                     | 0.000                     | 0.000                     | 2                      | 4                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 750   | U                          | NHH                         | 57                               | 0.633                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Construction and Mining Equipment | Bore/Drill Rigs          | D                        | 1000  | U                          | NHH                         | 145                              | 1.600                     | 0.000                     | 0.000                     | 2                      | 3                    |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4                       | 5     | U                          | NHH                         | 5                                | 0.029                     | 0.000                     | 0.000                     | 81                     | 20                   |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4                       | 15    | U                          | NHH                         | 16                               | 0.078                     | 0.000                     | 0.000                     | 138                    | 35                   |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4                       | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | D                        | 15    | U                          | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 5                      | 4                    |   |
| Construction and Mining Equipment | Cement and Mortar Mixers | D                        | 25    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 5     | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 4                      | 2                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 15    | U                          | NHH                         | 12                               | 0.057                     | 0.000                     | 0.000                     | 20                     | 17                   |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 25    | U                          | NHH                         | 7                                | 0.034                     | 0.000                     | 0.000                     | 6                      | 5                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 50    | U                          | NHH                         | 2                                | 0.021                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4                       | 120   | U                          | NHH                         | 2                                | 0.022                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 50    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 120   | U                          | NHH                         | 3                                | 0.032                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Construction and Mining Equipment | Concrete/Industrial Saws | D                        | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | G4                       | 50    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | G4                       | 120   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | G4                       | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Construction and Mining Equipment | Cranes                   | D                        | 50    | U                          | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Construction and Mining Equipment | Cranes                   | D                        | 120   | U                          | NHH                         | 27                               | 0.291                     | 0.000                     | 0.000                     | 3                      | 12                   |   |
| Construction and Mining Equipment | Cranes                   | D                        | 175   | U                          | NHH                         | 43                               | 0.466                     | 0.000                     | 0.000                     | 3                      | 12                   |   |
| Construction and Mining Equipment | Cranes                   | D                        | 250   | U                          | NHH                         | 114                              | 1.262                     | 0.000                     | 0.000                     | 6                      | 23                   |   |
| Construction and Mining Equipment | Cranes                   | D                        | 500   | U                          | NHH                         | 67                               | 0.743                     | 0.000                     | 0.000                     | 2                      | 8                    |   |

|                                   |                          | Commercial         |       |                         |                          |                            |                        |                        |                        |                     |                   |  |
|-----------------------------------|--------------------------|--------------------|-------|-------------------------|--------------------------|----------------------------|------------------------|------------------------|------------------------|---------------------|-------------------|---|
| Class of Equipment                | Equipment                | Engine Type & Fuel | MaxHP | Residential Application | Handheld or Non-handheld | Fuel Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) | Number of Equipment | Activity (hr/day) |   |
| Construction and Mining Equipment | Cranes                   | D                  | 750   | U                       | NHH                      | 90                         | 0.996                  | 0.000                  | 0.000                  | 2                   | 7                 |   |
| Construction and Mining Equipment | Cranes                   | D                  | 9999  | U                       | NHH                      | 363                        | 4.005                  | 0.000                  | 0.000                  | 2                   | 8                 |   |
| Construction and Mining Equipment | Crawler Tractors         | D                  | 50    | U                       | NHH                      | 0                          | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Crawler Tractors         | D                  | 120   | U                       | NHH                      | 604                        | 6.603                  | 0.001                  | 0.000                  | 71                  | 201               |   |
| Construction and Mining Equipment | Crawler Tractors         | D                  | 175   | U                       | NHH                      | 375                        | 4.115                  | 0.000                  | 0.000                  | 24                  | 68                |   |
| Construction and Mining Equipment | Crawler Tractors         | D                  | 250   | U                       | NHH                      | 439                        | 4.848                  | 0.000                  | 0.000                  | 21                  | 58                |   |
| Construction and Mining Equipment | Crawler Tractors         | D                  | 500   | U                       | NHH                      | 470                        | 5.184                  | 0.000                  | 0.000                  | 14                  | 40                |   |
| Construction and Mining Equipment | Crawler Tractors         | D                  | 750   | U                       | NHH                      | 46                         | 0.509                  | 0.000                  | 0.000                  | 1                   | 2                 |   |
| Construction and Mining Equipment | Crawler Tractors         | D                  | 1000  | U                       | NHH                      | 65                         | 0.720                  | 0.000                  | 0.000                  | 1                   | 2                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4                 | 15    | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4                 | 25    | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4                 | 120   | U                       | NHH                      | 1                          | 0.009                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                  | 50    | U                       | NHH                      | 8                          | 0.082                  | 0.000                  | 0.000                  | 1                   | 4                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                  | 120   | U                       | NHH                      | 40                         | 0.436                  | 0.000                  | 0.000                  | 4                   | 10                |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                  | 175   | U                       | NHH                      | 34                         | 0.371                  | 0.000                  | 0.000                  | 2                   | 4                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                  | 250   | U                       | NHH                      | 5                          | 0.054                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                  | 500   | U                       | NHH                      | 42                         | 0.465                  | 0.000                  | 0.000                  | 1                   | 2                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                  | 750   | U                       | NHH                      | 3                          | 0.037                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D                  | 9999  | U                       | NHH                      | 7                          | 0.082                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                 | 5     | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 4                   | 2                 |   |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                 | 15    | U                       | NHH                      | 1                          | 0.006                  | 0.000                  | 0.000                  | 9                   | 4                 |   |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                 | 25    | U                       | NHH                      | 1                          | 0.002                  | 0.000                  | 0.000                  | 2                   | 1                 |   |
| Construction and Mining Equipment | Dumpers/Tenders          | G4                 | 120   | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Dumpers/Tenders          | D                  | 25    | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Excavators               | D                  | 25    | U                       | NHH                      | 1                          | 0.010                  | 0.000                  | 0.000                  | 0                   | 1                 |   |
| Construction and Mining Equipment | Excavators               | D                  | 50    | U                       | NHH                      | 55                         | 0.600                  | 0.000                  | 0.000                  | 12                  | 48                |   |
| Construction and Mining Equipment | Excavators               | D                  | 120   | U                       | NHH                      | 438                        | 4.793                  | 0.000                  | 0.000                  | 34                  | 130               |   |
| Construction and Mining Equipment | Excavators               | D                  | 175   | U                       | NHH                      | 1,284                      | 14.094                 | 0.001                  | 0.000                  | 65                  | 251               |   |
| Construction and Mining Equipment | Excavators               | D                  | 250   | U                       | NHH                      | 734                        | 8.105                  | 0.000                  | 0.000                  | 26                  | 102               |   |
| Construction and Mining Equipment | Excavators               | D                  | 500   | U                       | NHH                      | 780                        | 8.612                  | 0.000                  | 0.000                  | 19                  | 74                |   |
| Construction and Mining Equipment | Excavators               | D                  | 750   | U                       | NHH                      | 31                         | 0.339                  | 0.000                  | 0.000                  | 0                   | 2                 |   |
| Construction and Mining Equipment | Graders                  | D                  | 50    | U                       | NHH                      | 0                          | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Graders                  | D                  | 120   | U                       | NHH                      | 74                         | 0.807                  | 0.000                  | 0.000                  | 8                   | 22                |   |
| Construction and Mining Equipment | Graders                  | D                  | 175   | U                       | NHH                      | 416                        | 4.559                  | 0.000                  | 0.000                  | 28                  | 74                |   |
| Construction and Mining Equipment | Graders                  | D                  | 250   | U                       | NHH                      | 356                        | 3.929                  | 0.000                  | 0.000                  | 18                  | 46                |   |
| Construction and Mining Equipment | Graders                  | D                  | 500   | U                       | NHH                      | 13                         | 0.148                  | 0.000                  | 0.000                  | 0                   | 1                 |   |
| Construction and Mining Equipment | Graders                  | D                  | 750   | U                       | NHH                      | 2                          | 0.018                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                  | 120   | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                  | 175   | U                       | NHH                      | 197                        | 2.154                  | 0.000                  | 0.000                  | 11                  | 33                |   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                  | 250   | U                       | NHH                      | 185                        | 2.036                  | 0.000                  | 0.000                  | 10                  | 31                |   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                  | 750   | U                       | NHH                      | 379                        | 4.171                  | 0.000                  | 0.000                  | 5                   | 15                |   |
| Construction and Mining Equipment | Off-Highway Tractors     | D                  | 1000  | U                       | NHH                      | 57                         | 0.631                  | 0.000                  | 0.000                  | 1                   | 2                 |   |
| Construction and Mining Equipment | Off-Highway Trucks       | D                  | 175   | U                       | NHH                      | 18                         | 0.196                  | 0.000                  | 0.000                  | 1                   | 3                 |   |
| Construction and Mining Equipment | Off-Highway Trucks       | D                  | 250   | U                       | NHH                      | 174                        | 1.926                  | 0.000                  | 0.000                  | 4                   | 23                |   |
| Construction and Mining Equipment | Off-Highway Trucks       | D                  | 500   | U                       | NHH                      | 401                        | 4.434                  | 0.000                  | 0.000                  | 6                   | 33                |   |
| Construction and Mining Equipment | Off-Highway Trucks       | D                  | 750   | U                       | NHH                      | 656                        | 7.249                  | 0.000                  | 0.000                  | 6                   | 33                |   |


| Class of Equipment                | Equipment                    | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                              |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Off-Highway Trucks           | D                        | 1000  | U                          | NHH                         | 435                              | 4.803                     | 0.000                     | 0.000                     | 3                      | 15                   |
| Construction and Mining Equipment | Other Construction Equipment | G4                       | 175   | U                          | NHH                         | 2                                | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 15    | U                          | NHH                         | 3                                | 0.028                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 25    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 50    | U                          | NHH                         | 2                                | 0.020                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 120   | U                          | NHH                         | 9                                | 0.098                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 175   | U                          | NHH                         | 16                               | 0.178                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Construction and Mining Equipment | Other Construction Equipment | D                        | 500   | U                          | NHH                         | 89                               | 0.984                     | 0.000                     | 0.000                     | 4                      | 8                    |
| Construction and Mining Equipment | Pavers                       | D                        | 25    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Pavers                       | D                        | 50    | U                          | NHH                         | 23                               | 0.247                     | 0.000                     | 0.000                     | 8                      | 18                   |
| Construction and Mining Equipment | Pavers                       | D                        | 120   | U                          | NHH                         | 66                               | 0.719                     | 0.000                     | 0.000                     | 9                      | 21                   |
| Construction and Mining Equipment | Pavers                       | D                        | 175   | U                          | NHH                         | 76                               | 0.829                     | 0.000                     | 0.000                     | 6                      | 13                   |
| Construction and Mining Equipment | Pavers                       | D                        | 250   | U                          | NHH                         | 14                               | 0.151                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Pavers                       | D                        | 500   | U                          | NHH                         | 17                               | 0.186                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 5     | U                          | NHH                         | 5                                | 0.030                     | 0.000                     | 0.000                     | 57                     | 27                   |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 15    | U                          | NHH                         | 31                               | 0.148                     | 0.000                     | 0.000                     | 97                     | 53                   |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 25    | U                          | NHH                         | 2                                | 0.007                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 50    | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | G4                       | 120   | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 25    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 50    | U                          | NHH                         | 0                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 120   | U                          | NHH                         | 16                               | 0.176                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 175   | U                          | NHH                         | 14                               | 0.153                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Paving Equipment             | D                        | 250   | U                          | NHH                         | 5                                | 0.052                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Plate Compactors             | G2                       | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Plate Compactors             | G4                       | 5     | U                          | NHH                         | 4                                | 0.021                     | 0.000                     | 0.000                     | 41                     | 20                   |
| Construction and Mining Equipment | Plate Compactors             | G4                       | 15    | U                          | NHH                         | 11                               | 0.051                     | 0.000                     | 0.000                     | 43                     | 24                   |
| Construction and Mining Equipment | Plate Compactors             | D                        | 15    | U                          | NHH                         | 1                                | 0.010                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 5     | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 5                      | 1                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 15    | U                          | NHH                         | 3                                | 0.017                     | 0.000                     | 0.000                     | 7                      | 6                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 25    | U                          | NHH                         | 5                                | 0.024                     | 0.000                     | 0.000                     | 5                      | 4                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 50    | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rollers                      | G4                       | 120   | U                          | NHH                         | 5                                | 0.041                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rollers                      | D                        | 15    | U                          | NHH                         | 3                                | 0.032                     | 0.000                     | 0.000                     | 5                      | 10                   |
| Construction and Mining Equipment | Rollers                      | D                        | 25    | U                          | NHH                         | 3                                | 0.029                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Rollers                      | D                        | 50    | U                          | NHH                         | 16                               | 0.174                     | 0.000                     | 0.000                     | 7                      | 13                   |
| Construction and Mining Equipment | Rollers                      | D                        | 120   | U                          | NHH                         | 194                              | 2.124                     | 0.000                     | 0.000                     | 38                     | 72                   |
| Construction and Mining Equipment | Rollers                      | D                        | 175   | U                          | NHH                         | 143                              | 1.566                     | 0.000                     | 0.000                     | 15                     | 29                   |
| Construction and Mining Equipment | Rollers                      | D                        | 250   | U                          | NHH                         | 28                               | 0.314                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Rollers                      | D                        | 500   | U                          | NHH                         | 29                               | 0.316                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | G4                       | 50    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | G4                       | 120   | U                          | NHH                         | 5                                | 0.047                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | G4                       | 175   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | D                        | 50    | U                          | NHH                         | 5                                | 0.052                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Rough Terrain Forklifts      | D                        | 120   | U                          | NHH                         | 417                              | 4.565                     | 0.000                     | 0.000                     | 47                     | 146                  |
| Construction and Mining Equipment | Rough Terrain Forklifts      | D                        | 175   | U                          | NHH                         | 107                              | 1.170                     | 0.000                     | 0.000                     | 6                      | 19                   |


| Class of Equipment                | Equipment               | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |     | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|-----------------------------------|-------------------------|--------------------------|-------|--|-----|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
|                                   |                         |                          |       | Handheld or<br>Non-handheld                    |     |                                  |                           |                           |                           |                        |                      |  |
| Construction and Mining Equipment | Rough Terrain Forklifts | D                        | 250   | U  | NHH | 8                                | 0.089                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Rough Terrain Forklifts | D                        | 500   | U  | NHH | 8                                | 0.088                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 175   | U  | NHH | 2                                | 0.025                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 250   | U  | NHH | 80                               | 0.885                     | 0.000                     | 0.000                     | 2                      | 10                   |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 500   | U  | NHH | 179                              | 1.966                     | 0.000                     | 0.000                     | 3                      | 15                   |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 750   | U  | NHH | 103                              | 1.131                     | 0.000                     | 0.000                     | 1                      | 6                    |  |
| Construction and Mining Equipment | Rubber Tired Dozers     | D                        | 1000  | U  | NHH | 10                               | 0.113                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | G4                       | 50    | U  | NHH | 1                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | G4                       | 120   | U  | NHH | 6                                | 0.049                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 25    | U  | NHH | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 50    | U  | NHH | 9                                | 0.100                     | 0.000                     | 0.000                     | 2                      | 6                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 120   | U  | NHH | 471                              | 5.152                     | 0.000                     | 0.000                     | 66                     | 175                  |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 175   | U  | NHH | 478                              | 5.240                     | 0.000                     | 0.000                     | 37                     | 99                   |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 250   | U  | NHH | 661                              | 7.303                     | 0.000                     | 0.000                     | 37                     | 98                   |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 500   | U  | NHH | 438                              | 4.835                     | 0.000                     | 0.000                     | 15                     | 41                   |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 750   | U  | NHH | 68                               | 0.752                     | 0.000                     | 0.000                     | 1                      | 3                    |  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D                        | 1000  | U  | NHH | 9                                | 0.099                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Scrapers                | D                        | 120   | U  | NHH | 5                                | 0.049                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Scrapers                | D                        | 175   | U  | NHH | 65                               | 0.713                     | 0.000                     | 0.000                     | 3                      | 10                   |  |
| Construction and Mining Equipment | Scrapers                | D                        | 250   | U  | NHH | 89                               | 0.983                     | 0.000                     | 0.000                     | 3                      | 9                    |  |
| Construction and Mining Equipment | Scrapers                | D                        | 500   | U  | NHH | 377                              | 4.153                     | 0.000                     | 0.000                     | 9                      | 26                   |  |
| Construction and Mining Equipment | Scrapers                | D                        | 750   | U  | NHH | 115                              | 1.273                     | 0.000                     | 0.000                     | 2                      | 5                    |  |
| Construction and Mining Equipment | Signal Boards           | G4                       | 5     | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Signal Boards           | G4                       | 15    | U  | NHH | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 15    | U  | NHH | 14                               | 0.159                     | 0.000                     | 0.000                     | 25                     | 51                   |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 50    | U  | NHH | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 120   | U  | NHH | 11                               | 0.120                     | 0.000                     | 0.000                     | 2                      | 3                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 175   | U  | NHH | 13                               | 0.143                     | 0.000                     | 0.000                     | 1                      | 2                    |  |
| Construction and Mining Equipment | Signal Boards           | D                        | 250   | U  | NHH | 5                                | 0.050                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 15    | U  | NHH | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 25    | U  | NHH | 28                               | 0.133                     | 0.000                     | 0.000                     | 29                     | 25                   |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 50    | U  | NHH | 7                                | 0.059                     | 0.000                     | 0.000                     | 4                      | 4                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | G4                       | 120   | U  | NHH | 9                                | 0.088                     | 0.000                     | 0.000                     | 3                      | 2                    |  |
| Construction and Mining Equipment | Skid Steer Loaders      | D                        | 25    | U  | NHH | 24                               | 0.269                     | 0.000                     | 0.000                     | 17                     | 39                   |  |
| Construction and Mining Equipment | Skid Steer Loaders      | D                        | 50    | U  | NHH | 420                              | 4.595                     | 0.000                     | 0.000                     | 155                    | 360                  |  |
| Construction and Mining Equipment | Skid Steer Loaders      | D                        | 120   | U  | NHH | 368                              | 4.034                     | 0.000                     | 0.000                     | 81                     | 189                  |  |
| Construction and Mining Equipment | Surfacing Equipment     | G4                       | 5     | U  | NHH | 1                                | 0.007                     | 0.000                     | 0.000                     | 10                     | 6                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | G4                       | 15    | U  | NHH | 17                               | 0.080                     | 0.000                     | 0.000                     | 31                     | 43                   |  |
| Construction and Mining Equipment | Surfacing Equipment     | G4                       | 25    | U  | NHH | 1                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 50    | U  | NHH | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 120   | U  | NHH | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 175   | U  | NHH | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 250   | U  | NHH | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 500   | U  | NHH | 6                                | 0.061                     | 0.000                     | 0.000                     | 0                      | 1                    |  |
| Construction and Mining Equipment | Surfacing Equipment     | D                        | 750   | U  | NHH | 6                                | 0.062                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Construction and Mining Equipment | Tampers/Rammers         | G2                       | 15    | U  | NHH | 2                                | 0.013                     | 0.000                     | 0.000                     | 24                     | 12                   |  |





| Class of Equipment                | Equipment                 | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|---------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                           |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Tampers/Rammers           | G4                       | 15    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | G4                       | 120   | U                          | NHH                         | 4                                | 0.035                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 25    | U                          | NHH                         | 5                                | 0.051                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 50    | U                          | NHH                         | 55                               | 0.597                     | 0.000                     | 0.000                     | 15                     | 39                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 120   | U                          | NHH                         | 1,242                            | 13.616                    | 0.001                     | 0.000                     | 200                    | 527                  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 175   | U                          | NHH                         | 181                              | 1.992                     | 0.000                     | 0.000                     | 15                     | 39                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 250   | U                          | NHH                         | 99                               | 1.091                     | 0.000                     | 0.000                     | 5                      | 13                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 500   | U                          | NHH                         | 320                              | 3.536                     | 0.000                     | 0.000                     | 8                      | 21                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D                        | 750   | U                          | NHH                         | 358                              | 3.959                     | 0.000                     | 0.000                     | 6                      | 15                   |
| Construction and Mining Equipment | Trenchers                 | G4                       | 15    | U                          | NHH                         | 7                                | 0.032                     | 0.000                     | 0.000                     | 9                      | 10                   |
| Construction and Mining Equipment | Trenchers                 | G4                       | 25    | U                          | NHH                         | 11                               | 0.052                     | 0.000                     | 0.000                     | 7                      | 8                    |
| Construction and Mining Equipment | Trenchers                 | G4                       | 50    | U                          | NHH                         | 7                                | 0.055                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Construction and Mining Equipment | Trenchers                 | G4                       | 120   | U                          | NHH                         | 4                                | 0.040                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 15    | U                          | NHH                         | 0                                | 0.005                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 25    | U                          | NHH                         | 2                                | 0.020                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 50    | U                          | NHH                         | 70                               | 0.756                     | 0.000                     | 0.000                     | 27                     | 46                   |
| Construction and Mining Equipment | Trenchers                 | D                        | 120   | U                          | NHH                         | 185                              | 2.020                     | 0.000                     | 0.000                     | 36                     | 62                   |
| Construction and Mining Equipment | Trenchers                 | D                        | 175   | U                          | NHH                         | 45                               | 0.490                     | 0.000                     | 0.000                     | 4                      | 7                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 250   | U                          | NHH                         | 6                                | 0.068                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 500   | U                          | NHH                         | 11                               | 0.121                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D                        | 750   | U                          | NHH                         | 3                                | 0.029                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D                        | 1000  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Crane (Dredging)          | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Deck/door engine          | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D                        | 9999  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D                        | 9999  | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |


| Class of Equipment      | Equipment                         | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |  | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|-------------------------|-----------------------------------|--------------------------|-------|--|--|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                         |                                   |                          |       |  |  |                             |                                  |                           |                           |                           |                        |                      |   |
| Dredging                | Hoist/swing/winch                 | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Other (Dredging)                  | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Dredging                | Pump (Dredging)                   | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Compressor (Entertainment)        | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 50    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 120   | U  |  | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 175   | U  |  | NHH                         | 3                                | 0.033                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 250   | U  |  | NHH                         | 6                                | 0.068                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 500   | U  |  | NHH                         | 13                               | 0.148                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 750   | U  |  | NHH                         | 5                                | 0.051                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Entertainment Equipment | Generator (Entertainment)         | D                        | 9999  | U  |  | NHH                         | 1                                | 0.013                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 15    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 25    | U  |  | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 2                      | 2                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 50    | U  |  | NHH                         | 4                                | 0.035                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | G4                       | 120   | U  |  | NHH                         | 8                                | 0.070                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | C4                       | 15    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Aerial Lifts                      | C4                       | 25    | U  |  | NHH                         | 3                                | 0.017                     | 0.000                     | 0.000                     | 2                      | 3                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 15    | U  |  | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 25    | U  |  | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 2                      | 2                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 50    | U  |  | NHH                         | 7                                | 0.078                     | 0.000                     | 0.000                     | 8                      | 8                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 120   | U  |  | NHH                         | 12                               | 0.134                     | 0.000                     | 0.000                     | 7                      | 7                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 500   | U  |  | NHH                         | 9                                | 0.096                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment    | Aerial Lifts                      | D                        | 750   | U  |  | NHH                         | 1                                | 0.014                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Forklifts                         | G4                       | 25    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Forklifts                         | G4                       | 50    | U  |  | NHH                         | 71                               | 0.471                     | 0.000                     | 0.000                     | 9                      | 44                   |   |
| Industrial Equipment    | Forklifts                         | G4                       | 120   | U  |  | NHH                         | 327                              | 2.788                     | 0.000                     | 0.001                     | 32                     | 155                  |   |
| Industrial Equipment    | Forklifts                         | G4                       | 175   | U  |  | NHH                         | 23                               | 0.207                     | 0.000                     | 0.000                     | 1                      | 6                    |   |
| Industrial Equipment    | Forklifts                         | C4                       | 25    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Forklifts                         | C4                       | 50    | U  |  | NHH                         | 108                              | 0.743                     | 0.001                     | 0.000                     | 16                     | 81                   |   |
| Industrial Equipment    | Forklifts                         | C4                       | 120   | U  |  | NHH                         | 679                              | 4.454                     | 0.004                     | 0.000                     | 58                     | 285                  |   |
| Industrial Equipment    | Forklifts                         | C4                       | 175   | U  |  | NHH                         | 51                               | 0.340                     | 0.000                     | 0.000                     | 2                      | 10                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 50    | U  |  | NHH                         | 8                                | 0.083                     | 0.000                     | 0.000                     | 2                      | 11                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 120   | U  |  | NHH                         | 25                               | 0.276                     | 0.000                     | 0.000                     | 4                      | 18                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 175   | U  |  | NHH                         | 45                               | 0.498                     | 0.000                     | 0.000                     | 4                      | 18                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 250   | U  |  | NHH                         | 62                               | 0.680                     | 0.000                     | 0.000                     | 4                      | 18                   |   |
| Industrial Equipment    | Forklifts                         | D                        | 500   | U  |  | NHH                         | 38                               | 0.419                     | 0.000                     | 0.000                     | 2                      | 8                    |   |
| Industrial Equipment    | Other General Industrial Equipmen | G2                       | 15    | U  |  | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment    | Other General Industrial Equipmen | G4                       | 15    | U  |  | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 3                      | 3                    |   |


| Class of Equipment        | Equipment                         | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|---------------------------|-----------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                           |                                   |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 25    | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 50    | U                          | NHH                         | 3                                | 0.024                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 120   | U                          | NHH                         | 2                                | 0.020                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | G4                       | 175   | U                          | NHH                         | 0                                | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 15    | U                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 0                      | 2                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 25    | U                          | NHH                         | 2                                | 0.018                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 50    | U                          | NHH                         | 3                                | 0.031                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 120   | U                          | NHH                         | 32                               | 0.354                     | 0.000                     | 0.000                     | 3                      | 11                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 175   | U                          | NHH                         | 50                               | 0.549                     | 0.000                     | 0.000                     | 3                      | 11                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 250   | U                          | NHH                         | 70                               | 0.773                     | 0.000                     | 0.000                     | 3                      | 11                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 500   | U                          | NHH                         | 137                              | 1.510                     | 0.000                     | 0.000                     | 3                      | 11                   |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 750   | U                          | NHH                         | 56                               | 0.622                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Industrial Equipment      | Other General Industrial Equipmen | D                        | 1000  | U                          | NHH                         | 44                               | 0.484                     | 0.000                     | 0.000                     | 0                      | 2                    |   |
| Industrial Equipment      | Other Material Handling Equipment | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | G4                       | 120   | U                          | NHH                         | 2                                | 0.014                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 50    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 120   | U                          | NHH                         | 1                                | 0.014                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 175   | U                          | NHH                         | 3                                | 0.030                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 250   | U                          | NHH                         | 8                                | 0.084                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 500   | U                          | NHH                         | 2                                | 0.021                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Other Material Handling Equipment | D                        | 9999  | U                          | NHH                         | 2                                | 0.024                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 15    | U                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 25    | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 50    | U                          | NHH                         | 9                                | 0.076                     | 0.000                     | 0.000                     | 3                      | 4                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 120   | U                          | NHH                         | 13                               | 0.122                     | 0.000                     | 0.000                     | 2                      | 3                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | G4                       | 175   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 25    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 50    | U                          | NHH                         | 16                               | 0.172                     | 0.000                     | 0.000                     | 3                      | 11                   |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 120   | U                          | NHH                         | 62                               | 0.678                     | 0.000                     | 0.000                     | 5                      | 18                   |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 175   | U                          | NHH                         | 53                               | 0.578                     | 0.000                     | 0.000                     | 2                      | 8                    |   |
| Industrial Equipment      | Sweepers/Scrubbers                | D                        | 250   | U                          | NHH                         | 10                               | 0.108                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 2     | C                          | HH                          | 17                               | 0.069                     | 0.001                     | 0.000                     | 356                    | 282                  |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 2     | R                          | HH                          | 3                                | 0.013                     | 0.000                     | 0.000                     | 4,002                  | 54                   |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 15    | C                          | HH                          | 29                               | 0.117                     | 0.001                     | 0.000                     | 251                    | 199                  |   |
| Lawn and Garden Equipment | Chainsaws                         | G2                       | 15    | R                          | HH                          | 4                                | 0.022                     | 0.000                     | 0.000                     | 2,819                  | 38                   |   |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2                       | 15    | C                          | HH                          | 36                               | 0.146                     | 0.002                     | 0.000                     | 312                    | 247                  |   |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2                       | 15    | R                          | HH                          | 6                                | 0.028                     | 0.000                     | 0.000                     | 3,509                  | 47                   |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 15    | C                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 15    | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 25    | C                          | NHH                         | 16                               | 0.073                     | 0.000                     | 0.000                     | 3                      | 11                   |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4                       | 25    | R                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 6                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 120   | U                          | NHH                         | 5                                | 0.060                     | 0.000                     | 0.000                     | 1                      | 2                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 175   | U                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D                        | 250   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |

| Class of Equipment        | Equipment                     | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------|-------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                           |                               |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D                        | 500   | U                          | NHH                         | 3                                | 0.029                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D                        | 750   | U                          | NHH                         | 7                                | 0.079                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D                        | 1000  | U                          | NHH                         | 19                               | 0.215                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G2                       | 15    | C                          | NHH                         | 4                                | 0.022                     | 0.000                     | 0.000                     | 5                      | 10                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G2                       | 25    | C                          | NHH                         | 4                                | 0.023                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 15    | C                          | NHH                         | 49                               | 0.238                     | 0.000                     | 0.000                     | 42                     | 92                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 25    | C                          | NHH                         | 43                               | 0.203                     | 0.000                     | 0.000                     | 21                     | 45                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 50    | U                          | NHH                         | 28                               | 0.202                     | 0.000                     | 0.000                     | 8                      | 17                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4                       | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | D                        | 15    | U                          | NHH                         | 3                                | 0.034                     | 0.000                     | 0.000                     | 2                      | 7                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | D                        | 25    | U                          | NHH                         | 88                               | 0.965                     | 0.000                     | 0.000                     | 46                     | 133                  |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 15    | C                          | NHH                         | 12                               | 0.057                     | 0.000                     | 0.000                     | 30                     | 22                   |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 15    | R                          | NHH                         | 39                               | 0.191                     | 0.000                     | 0.000                     | 954                    | 74                   |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 25    | C                          | NHH                         | 12                               | 0.058                     | 0.000                     | 0.000                     | 23                     | 17                   |
| Lawn and Garden Equipment | Front Mowers                  | G4                       | 25    | R                          | NHH                         | 41                               | 0.195                     | 0.000                     | 0.000                     | 748                    | 58                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 15    | C                          | NHH                         | 27                               | 0.130                     | 0.000                     | 0.000                     | 118                    | 42                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 15    | R                          | NHH                         | 20                               | 0.096                     | 0.000                     | 0.000                     | 767                    | 31                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 25    | C                          | NHH                         | 17                               | 0.079                     | 0.000                     | 0.000                     | 47                     | 16                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 25    | R                          | NHH                         | 12                               | 0.058                     | 0.000                     | 0.000                     | 302                    | 12                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4                       | 50    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | D                        | 15    | U                          | NHH                         | 61                               | 0.666                     | 0.000                     | 0.000                     | 96                     | 144                  |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | D                        | 25    | U                          | NHH                         | 73                               | 0.802                     | 0.000                     | 0.000                     | 75                     | 112                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G2                       | 15    | C                          | NHH                         | 14                               | 0.085                     | 0.000                     | 0.000                     | 199                    | 124                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G2                       | 15    | R                          | NHH                         | 8                                | 0.043                     | 0.000                     | 0.000                     | 1,492                  | 63                   |
| Lawn and Garden Equipment | Lawn Mowers                   | G4                       | 5     | C                          | NHH                         | 89                               | 0.502                     | 0.001                     | 0.001                     | 1,176                  | 736                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G4                       | 5     | R                          | NHH                         | 106                              | 0.540                     | 0.000                     | 0.001                     | 18,645                 | 792                  |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G2                       | 2     | C                          | HH                          | 50                               | 0.221                     | 0.002                     | 0.000                     | 1,732                  | 932                  |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G2                       | 2     | R                          | HH                          | 3                                | 0.014                     | 0.000                     | 0.000                     | 4,465                  | 59                   |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G4                       | 5     | C                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 55                     | 9                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G4                       | 5     | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 47                     | 1                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D                        | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 2     | C                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 2     | R                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 60                     | 1                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 15    | C                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2                       | 15    | R                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 26                     | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 5     | C                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 37                     | 7                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 5     | R                          | NHH                         | 3                                | 0.015                     | 0.000                     | 0.000                     | 1,125                  | 13                   |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 15    | C                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 16                     | 3                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 15    | R                          | NHH                         | 3                                | 0.013                     | 0.000                     | 0.000                     | 500                    | 6                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 25    | C                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 25    | R                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 11                     | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4                       | 120   | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | D                        | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment         | Equipment                     | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------|-------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                            |                               |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | D                        | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 15    | C                          | NHH                         | 159                              | 0.775                     | 0.000                     | 0.001                     | 644                    | 479                  |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 15    | R                          | NHH                         | 14                               | 0.071                     | 0.000                     | 0.000                     | 565                    | 44                   |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 25    | C                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 3                      | 2                    |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4                       | 25    | R                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 3                      | 0                    |
| Lawn and Garden Equipment  | Shredders                     | G2                       | 15    | C                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 9                      | 3                    |
| Lawn and Garden Equipment  | Shredders                     | G2                       | 15    | R                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 312                    | 1                    |
| Lawn and Garden Equipment  | Shredders                     | G4                       | 5     | C                          | NHH                         | 2                                | 0.013                     | 0.000                     | 0.000                     | 23                     | 9                    |
| Lawn and Garden Equipment  | Shredders                     | G4                       | 5     | R                          | NHH                         | 1                                | 0.003                     | 0.000                     | 0.000                     | 862                    | 2                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 15    | C                          | HH                          | 0                                | 0.002                     | 0.000                     | 0.000                     | 14                     | 2                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 15    | R                          | HH                          | 0                                | 0.001                     | 0.000                     | 0.000                     | 125                    | 1                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 25    | C                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2                       | 25    | R                          | HH                          | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 5     | C                          | NHH                         | 2                                | 0.012                     | 0.000                     | 0.000                     | 150                    | 18                   |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 5     | R                          | NHH                         | 1                                | 0.004                     | 0.000                     | 0.000                     | 1,346                  | 7                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 15    | C                          | NHH                         | 4                                | 0.020                     | 0.000                     | 0.000                     | 113                    | 13                   |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 15    | R                          | NHH                         | 2                                | 0.008                     | 0.000                     | 0.000                     | 1,019                  | 5                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 25    | C                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4                       | 25    | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 3                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | D                        | 175   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | D                        | 250   | U                          | NHH                         | 7                                | 0.072                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Lawn and Garden Equipment  | Snowblowers                   | D                        | 500   | U                          | NHH                         | 29                               | 0.320                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Lawn and Garden Equipment  | Tillers                       | G4                       | 5     | C                          | NHH                         | 3                                | 0.014                     | 0.000                     | 0.000                     | 122                    | 19                   |
| Lawn and Garden Equipment  | Tillers                       | G4                       | 5     | R                          | NHH                         | 3                                | 0.018                     | 0.000                     | 0.000                     | 474                    | 23                   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2                       | 2     | C                          | HH                          | 17                               | 0.082                     | 0.001                     | 0.000                     | 1,160                  | 386                  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2                       | 2     | R                          | HH                          | 32                               | 0.162                     | 0.001                     | 0.000                     | 12,928                 | 761                  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4                       | 5     | C                          | NHH                         | 2                                | 0.014                     | 0.000                     | 0.000                     | 215                    | 80                   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4                       | 5     | R                          | NHH                         | 2                                | 0.010                     | 0.000                     | 0.000                     | 1,000                  | 59                   |
| Lawn and Garden Equipment  | Wood Splitters                | G4                       | 5     | C                          | NHH                         | 4                                | 0.023                     | 0.000                     | 0.000                     | 40                     | 14                   |
| Lawn and Garden Equipment  | Wood Splitters                | G4                       | 5     | R                          | NHH                         | 1                                | 0.005                     | 0.000                     | 0.000                     | 991                    | 3                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 5     | C                          | NHH                         | 9                                | 0.051                     | 0.000                     | 0.000                     | 25                     | 39                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 5     | R                          | NHH                         | 5                                | 0.027                     | 0.000                     | 0.000                     | 20                     | 20                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 15    | C                          | NHH                         | 8                                | 0.036                     | 0.000                     | 0.000                     | 13                     | 20                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 15    | R                          | NHH                         | 4                                | 0.019                     | 0.000                     | 0.000                     | 10                     | 10                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 25    | C                          | NHH                         | 3                                | 0.012                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 25    | R                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 50    | U                          | NHH                         | 9                                | 0.065                     | 0.000                     | 0.000                     | 3                      | 4                    |
| Light Commercial Equipment | Air Compressors               | G4                       | 120   | U                          | NHH                         | 47                               | 0.418                     | 0.000                     | 0.000                     | 9                      | 12                   |
| Light Commercial Equipment | Air Compressors               | G4                       | 175   | U                          | NHH                         | 6                                | 0.052                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Air Compressors               | D                        | 15    | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Air Compressors               | D                        | 25    | U                          | NHH                         | 1                                | 0.012                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Light Commercial Equipment | Air Compressors               | D                        | 50    | U                          | NHH                         | 15                               | 0.163                     | 0.000                     | 0.000                     | 7                      | 15                   |
| Light Commercial Equipment | Air Compressors               | D                        | 120   | U                          | NHH                         | 209                              | 2.292                     | 0.000                     | 0.000                     | 44                     | 98                   |
| Light Commercial Equipment | Air Compressors               | D                        | 175   | U                          | NHH                         | 15                               | 0.164                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Light Commercial Equipment | Air Compressors               | D                        | 250   | U                          | NHH                         | 31                               | 0.341                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Light Commercial Equipment | Air Compressors               | D                        | 500   | U                          | NHH                         | 71                               | 0.786                     | 0.000                     | 0.000                     | 3                      | 7                    |

| Class of Equipment         | Equipment        | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|----------------------------|------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                            |                  |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Light Commercial Equipment | Air Compressors  | D                        | 750   | U                          | NHH                         | 41                               | 0.454                     | 0.000                     | 0.000                     | 1                      | 3                    |   |
| Light Commercial Equipment | Air Compressors  | D                        | 1000  | U                          | NHH                         | 1                                | 0.015                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment | Gas Compressors  | C4                       | 50    | U                          | NHH                         | 17                               | 0.117                     | 0.000                     | 0.000                     | 0                      | 5                    |   |
| Light Commercial Equipment | Gas Compressors  | C4                       | 120   | U                          | NHH                         | 100                              | 0.657                     | 0.000                     | 0.000                     | 0                      | 10                   |   |
| Light Commercial Equipment | Gas Compressors  | C4                       | 175   | U                          | NHH                         | 26                               | 0.171                     | 0.000                     | 0.000                     | 0                      | 2                    |   |
| Light Commercial Equipment | Gas Compressors  | C4                       | 250   | U                          | NHH                         | 27                               | 0.176                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Light Commercial Equipment | Gas Compressors  | C4                       | 500   | U                          | NHH                         | 37                               | 0.248                     | 0.000                     | 0.000                     | 0                      | 1                    |   |
| Light Commercial Equipment | Generator Sets   | G2                       | 2     | C                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 15                     | 5                    |   |
| Light Commercial Equipment | Generator Sets   | G2                       | 2     | R                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 12                     | 3                    |   |
| Light Commercial Equipment | Generator Sets   | G2                       | 15    | C                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment | Generator Sets   | G2                       | 15    | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 5     | C                          | NHH                         | 16                               | 0.092                     | 0.000                     | 0.000                     | 195                    | 72                   |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 5     | R                          | NHH                         | 9                                | 0.049                     | 0.000                     | 0.000                     | 153                    | 38                   |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 15    | C                          | NHH                         | 118                              | 0.570                     | 0.000                     | 0.000                     | 535                    | 197                  |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 15    | R                          | NHH                         | 63                               | 0.301                     | 0.000                     | 0.000                     | 421                    | 104                  |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 25    | C                          | NHH                         | 137                              | 0.647                     | 0.000                     | 0.000                     | 288                    | 106                  |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 25    | R                          | NHH                         | 73                               | 0.342                     | 0.000                     | 0.000                     | 226                    | 56                   |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 50    | U                          | NHH                         | 67                               | 0.566                     | 0.000                     | 0.000                     | 96                     | 30                   |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 120   | U                          | NHH                         | 30                               | 0.280                     | 0.000                     | 0.000                     | 18                     | 6                    |   |
| Light Commercial Equipment | Generator Sets   | G4                       | 175   | U                          | NHH                         | 5                                | 0.045                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Light Commercial Equipment | Generator Sets   | C4                       | 120   | U                          | NHH                         | 3                                | 0.018                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Light Commercial Equipment | Generator Sets   | C4                       | 175   | U                          | NHH                         | 4                                | 0.027                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Light Commercial Equipment | Generator Sets   | D                        | 15    | U                          | NHH                         | 15                               | 0.169                     | 0.000                     | 0.000                     | 36                     | 33                   |   |
| Light Commercial Equipment | Generator Sets   | D                        | 25    | U                          | NHH                         | 19                               | 0.213                     | 0.000                     | 0.000                     | 26                     | 24                   |   |
| Light Commercial Equipment | Generator Sets   | D                        | 50    | U                          | NHH                         | 41                               | 0.452                     | 0.000                     | 0.000                     | 32                     | 30                   |   |
| Light Commercial Equipment | Generator Sets   | D                        | 120   | U                          | NHH                         | 159                              | 1.748                     | 0.000                     | 0.000                     | 49                     | 45                   |   |
| Light Commercial Equipment | Generator Sets   | D                        | 175   | U                          | NHH                         | 17                               | 0.188                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Light Commercial Equipment | Generator Sets   | D                        | 250   | U                          | NHH                         | 14                               | 0.157                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Light Commercial Equipment | Generator Sets   | D                        | 500   | U                          | NHH                         | 50                               | 0.555                     | 0.000                     | 0.000                     | 4                      | 3                    |   |
| Light Commercial Equipment | Generator Sets   | D                        | 750   | U                          | NHH                         | 50                               | 0.556                     | 0.000                     | 0.000                     | 2                      | 2                    |   |
| Light Commercial Equipment | Generator Sets   | D                        | 9999  | U                          | NHH                         | 25                               | 0.279                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Light Commercial Equipment | Pressure Washers | G4                       | 5     | C                          | NHH                         | 7                                | 0.039                     | 0.000                     | 0.000                     | 52                     | 19                   |   |
| Light Commercial Equipment | Pressure Washers | G4                       | 5     | R                          | NHH                         | 4                                | 0.020                     | 0.000                     | 0.000                     | 41                     | 10                   |   |
| Light Commercial Equipment | Pressure Washers | G4                       | 15    | C                          | NHH                         | 10                               | 0.048                     | 0.000                     | 0.000                     | 47                     | 17                   |   |
| Light Commercial Equipment | Pressure Washers | G4                       | 15    | R                          | NHH                         | 5                                | 0.026                     | 0.000                     | 0.000                     | 37                     | 9                    |   |
| Light Commercial Equipment | Pressure Washers | G4                       | 25    | C                          | NHH                         | 5                                | 0.023                     | 0.000                     | 0.000                     | 9                      | 3                    |   |
| Light Commercial Equipment | Pressure Washers | G4                       | 25    | R                          | NHH                         | 3                                | 0.012                     | 0.000                     | 0.000                     | 7                      | 2                    |   |
| Light Commercial Equipment | Pressure Washers | G4                       | 50    | U                          | NHH                         | 1                                | 0.006                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Light Commercial Equipment | Pressure Washers | D                        | 15    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 2                      | 1                    |   |
| Light Commercial Equipment | Pressure Washers | D                        | 25    | U                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment | Pressure Washers | D                        | 50    | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Light Commercial Equipment | Pressure Washers | D                        | 120   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment | Pumps            | G2                       | 2     | C                          | NHH                         | 2                                | 0.014                     | 0.000                     | 0.000                     | 59                     | 42                   |   |
| Light Commercial Equipment | Pumps            | G2                       | 2     | R                          | NHH                         | 1                                | 0.007                     | 0.000                     | 0.000                     | 46                     | 22                   |   |
| Light Commercial Equipment | Pumps            | G2                       | 15    | C                          | NHH                         | 6                                | 0.029                     | 0.000                     | 0.000                     | 16                     | 11                   |   |
| Light Commercial Equipment | Pumps            | G2                       | 15    | R                          | NHH                         | 3                                | 0.016                     | 0.000                     | 0.000                     | 12                     | 6                    |   |

| Class of Equipment              | Equipment        | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|---------------------------------|------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                                 |                  |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |   |
| Light Commercial Equipment      | Pumps            | G2                       | 25    | C                          | NHH                         | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Pumps            | G2                       | 25    | R                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Pumps            | G4                       | 5     | C                          | NHH                         | 8                                | 0.048                     | 0.000                     | 0.000                     | 69                     | 49                   |   |
| Light Commercial Equipment      | Pumps            | G4                       | 5     | R                          | NHH                         | 4                                | 0.025                     | 0.000                     | 0.000                     | 54                     | 26                   |   |
| Light Commercial Equipment      | Pumps            | G4                       | 15    | C                          | NHH                         | 29                               | 0.138                     | 0.000                     | 0.000                     | 75                     | 53                   |   |
| Light Commercial Equipment      | Pumps            | G4                       | 15    | R                          | NHH                         | 15                               | 0.073                     | 0.000                     | 0.000                     | 59                     | 28                   |   |
| Light Commercial Equipment      | Pumps            | G4                       | 25    | C                          | NHH                         | 16                               | 0.075                     | 0.000                     | 0.000                     | 19                     | 14                   |   |
| Light Commercial Equipment      | Pumps            | G4                       | 25    | R                          | NHH                         | 9                                | 0.040                     | 0.000                     | 0.000                     | 15                     | 7                    |   |
| Light Commercial Equipment      | Pumps            | G4                       | 50    | U                          | NHH                         | 10                               | 0.085                     | 0.000                     | 0.000                     | 8                      | 5                    |   |
| Light Commercial Equipment      | Pumps            | G4                       | 120   | U                          | NHH                         | 35                               | 0.321                     | 0.000                     | 0.000                     | 10                     | 6                    |   |
| Light Commercial Equipment      | Pumps            | G4                       | 175   | U                          | NHH                         | 2                                | 0.015                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Pumps            | D                        | 15    | U                          | NHH                         | 10                               | 0.110                     | 0.000                     | 0.000                     | 27                     | 30                   |   |
| Light Commercial Equipment      | Pumps            | D                        | 25    | U                          | NHH                         | 8                                | 0.086                     | 0.000                     | 0.000                     | 8                      | 9                    |   |
| Light Commercial Equipment      | Pumps            | D                        | 50    | U                          | NHH                         | 24                               | 0.264                     | 0.000                     | 0.000                     | 14                     | 15                   |   |
| Light Commercial Equipment      | Pumps            | D                        | 120   | U                          | NHH                         | 107                              | 1.177                     | 0.000                     | 0.000                     | 27                     | 30                   |   |
| Light Commercial Equipment      | Pumps            | D                        | 175   | U                          | NHH                         | 21                               | 0.229                     | 0.000                     | 0.000                     | 3                      | 3                    |   |
| Light Commercial Equipment      | Pumps            | D                        | 250   | U                          | NHH                         | 21                               | 0.237                     | 0.000                     | 0.000                     | 2                      | 2                    |   |
| Light Commercial Equipment      | Pumps            | D                        | 500   | U                          | NHH                         | 1                                | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Pumps            | D                        | 750   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Pumps            | D                        | 9999  | U                          | NHH                         | 10                               | 0.115                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Welders          | G4                       | 15    | C                          | NHH                         | 15                               | 0.074                     | 0.000                     | 0.000                     | 49                     | 28                   |   |
| Light Commercial Equipment      | Welders          | G4                       | 25    | C                          | NHH                         | 89                               | 0.412                     | 0.000                     | 0.000                     | 177                    | 100                  |   |
| Light Commercial Equipment      | Welders          | G4                       | 50    | U                          | NHH                         | 21                               | 0.171                     | 0.000                     | 0.000                     | 15                     | 9                    |   |
| Light Commercial Equipment      | Welders          | G4                       | 120   | U                          | NHH                         | 29                               | 0.269                     | 0.000                     | 0.000                     | 16                     | 9                    |   |
| Light Commercial Equipment      | Welders          | G4                       | 175   | U                          | NHH                         | 4                                | 0.034                     | 0.000                     | 0.000                     | 1                      | 1                    |   |
| Light Commercial Equipment      | Welders          | D                        | 15    | U                          | NHH                         | 6                                | 0.066                     | 0.000                     | 0.000                     | 12                     | 21                   |   |
| Light Commercial Equipment      | Welders          | D                        | 25    | U                          | NHH                         | 10                               | 0.106                     | 0.000                     | 0.000                     | 11                     | 19                   |   |
| Light Commercial Equipment      | Welders          | D                        | 50    | U                          | NHH                         | 69                               | 0.750                     | 0.000                     | 0.000                     | 33                     | 58                   |   |
| Light Commercial Equipment      | Welders          | D                        | 120   | U                          | NHH                         | 81                               | 0.887                     | 0.000                     | 0.000                     | 26                     | 45                   |   |
| Light Commercial Equipment      | Welders          | D                        | 175   | U                          | NHH                         | 1                                | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Welders          | D                        | 250   | U                          | NHH                         | 0                                | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Light Commercial Equipment      | Welders          | D                        | 500   | U                          | NHH                         | 1                                | 0.010                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Logging Equipment               | Chainsaws        | G2                       | 15    | U                          | HH                          | 358                              | 1.515                     | 0.017                     | 0.001                     | 770                    | 435                  |   |
| Logging Equipment               | Fellers/Bunchers | D                        | 120   | U                          | NHH                         | 1,428                            | 15.666                    | 0.001                     | 0.000                     | 98                     | 342                  |   |
| Logging Equipment               | Fellers/Bunchers | D                        | 175   | U                          | NHH                         | 2,603                            | 28.595                    | 0.001                     | 0.000                     | 121                    | 423                  |   |
| Logging Equipment               | Fellers/Bunchers | D                        | 250   | U                          | NHH                         | 2,274                            | 25.137                    | 0.001                     | 0.000                     | 74                     | 258                  |   |
| Logging Equipment               | Fellers/Bunchers | D                        | 500   | U                          | NHH                         | 1,003                            | 11.092                    | 0.000                     | 0.000                     | 22                     | 76                   |   |
| Logging Equipment               | Fellers/Bunchers | D                        | 750   | U                          | NHH                         | 152                              | 1.681                     | 0.000                     | 0.000                     | 2                      | 6                    |   |
| Logging Equipment               | Shredders        | G4                       | 15    | U                          | NHH                         | 505                              | 2.429                     | 0.002                     | 0.002                     | 1,208                  | 802                  |   |
| Logging Equipment               | Shredders        | D                        | 175   | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Logging Equipment               | Skidders         | D                        | 120   | U                          | NHH                         | 767                              | 8.410                     | 0.000                     | 0.000                     | 45                     | 178                  |   |
| Logging Equipment               | Skidders         | D                        | 175   | U                          | NHH                         | 1,812                            | 19.911                    | 0.001                     | 0.000                     | 72                     | 284                  |   |
| Logging Equipment               | Skidders         | D                        | 250   | U                          | NHH                         | 996                              | 11.009                    | 0.000                     | 0.000                     | 26                     | 105                  |   |
| Logging Equipment               | Skidders         | D                        | 500   | U                          | NHH                         | 67                               | 0.737                     | 0.000                     | 0.000                     | 1                      | 6                    |   |
| Military Tactical Support Equip | A/C unit         | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Military Tactical Support Equip | A/C unit         | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |


| Class of Equipment              | Equipment                        | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------------|----------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                 |                                  |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Military Tactical Support Equip | A/C unit                         | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Aircraft Support                 | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Aircraft Support                 | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Cart                             | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Cart                             | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Cart                             | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Communications                   | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Communications                   | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Compressor (Military)            | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Crane                            | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Crane                            | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Crane                            | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Deicer                           | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Hydraulic unit                   | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Lift (Military)                  | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Light                            | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D                        | 750   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Pressure Washers                 | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Pump (Military)                  | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Pump (Military)                  | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Start Cart                       | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Start Cart                       | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D                        | 250   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D                        | 500   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Welder                           | D                        | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Welder                           | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D                        | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D                        | 175   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment | Equipment                | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |  | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|--------------------|--------------------------|--------------------------|-------|--|--|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                    |                          |                          |       |  |  |                             |                                  |                           |                           |                           |                        |                      |
| Oil Drilling       | Compressors (Workover)   | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Compressors (Workover)   | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Compressors (Workover)   | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Compressors (Workover)   | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig                | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 50    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Drill Rig (Mobile)       | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 50    | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Drilling)     | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Generator (Workover)     | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Lift (Drilling)          | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Other Workover Equipment | D                        | 1000  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pressure Washers         | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 120   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 175   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 250   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 500   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 750   | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling       | Pump (Drilling)          | D                        | 9999  | U  |  | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |





| Class of Equipment       | Equipment                          | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or<br>Residential<br>Application |     | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|--------------------------|------------------------------------|--------------------------|-------|--|-----|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|---|
|                          |                                    |                          |       | Handheld or<br>Non-handheld                    |     |                                  |                           |                           |                           |                        |                      |   |
| Oil Drilling             | Pump (Workover)                    | D                        | 120   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                    | D                        | 175   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                    | D                        | 250   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                    | D                        | 500   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Pump (Workover)                    | D                        | 9999  | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Snubbing                           | D                        | 120   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                             | D                        | 120   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                             | D                        | 175   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                             | D                        | 250   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Swivel                             | D                        | 500   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)              | D                        | 50    | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)              | D                        | 120   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)              | D                        | 175   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)              | D                        | 250   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)              | D                        | 500   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)              | D                        | 750   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Oil Drilling             | Workover Rig (Mobile)              | D                        | 1000  | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment            | D                        | 120   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment            | D                        | 175   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment            | D                        | 250   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment            | D                        | 500   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment            | D                        | 750   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Other Portable Equipment | Misc Portable Equipment            | D                        | 1000  | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Pleasure Craft           | Personal Water Craft               | G2                       | 9999  | U  | NHH | 5,115                            | 44.874                    | 0.042                     | 0.009                     | 20,109                 | 1,367                |   |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine  | G4                       | 15    | U  | NHH | 1                                | 0.009                     | 0.000                     | 0.000                     | 120                    | 3                    |   |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine  | D                        | 50    | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |   |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin  | G2                       | 15    | U  | NHH | 0                                | 0.002                     | 0.000                     | 0.000                     | 79                     | 2                    |   |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engine | G2                       | 25    | U  | NHH | 0                                | 0.003                     | 0.000                     | 0.000                     | 42                     | 1                    |   |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engine | G2                       | 50    | U  | NHH | 1                                | 0.010                     | 0.000                     | 0.000                     | 39                     | 1                    |   |
| Pleasure Craft           | Vessels w/Inboard Engines          | G4                       | 250   | U  | NHH | 6,750                            | 52.194                    | 0.012                     | 0.009                     | 4,849                  | 1,232                |   |
| Pleasure Craft           | Vessels w/Inboard Engines          | D                        | 250   | U  | NHH | 2                                | 0.024                     | 0.000                     | 0.000                     | 2                      | 0                    |   |
| Pleasure Craft           | Vessels w/Inboard Jet Engines      | G4                       | 500   | U  | NHH | 1,532                            | 11.836                    | 0.003                     | 0.002                     | 1,179                  | 235                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 2     | U  | NHH | 1                                | 0.005                     | 0.000                     | 0.000                     | 135                    | 18                   |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 15    | U  | NHH | 157                              | 0.888                     | 0.006                     | 0.001                     | 7,446                  | 977                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 25    | U  | NHH | 128                              | 0.804                     | 0.004                     | 0.001                     | 2,023                  | 265                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 50    | U  | NHH | 337                              | 2.649                     | 0.006                     | 0.001                     | 1,975                  | 259                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 120   | U  | NHH | 622                              | 4.917                     | 0.010                     | 0.001                     | 1,737                  | 228                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 175   | U  | NHH | 519                              | 4.053                     | 0.008                     | 0.001                     | 802                    | 105                  |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 250   | U  | NHH | 191                              | 1.529                     | 0.003                     | 0.000                     | 230                    | 30                   |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G2                       | 500   | U  | NHH | 56                               | 0.431                     | 0.001                     | 0.000                     | 46                     | 6                    |   |
| Pleasure Craft           | Vessels w/Outboard Engines         | G4                       | 50    | U  | NHH | 124                              | 0.845                     | 0.000                     | 0.000                     | 693                    | 91                   |   |
| Pleasure Craft           | Vessels w/Sterndrive Engines       | G4                       | 250   | U  | NHH | 9,183                            | 71.115                    | 0.016                     | 0.015                     | 11,373                 | 2,269                |   |
| Railyard Operations      | Compressor (Railyard)              | D                        | 120   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Railyard Operations      | Crane (Rail-CHE)                   | D                        | 120   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Railyard Operations      | Crane (Rail-CHE)                   | D                        | 175   | U  | NHH | 0                                | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |   |
| Railyard Operations      | Generator (Railyard)               | D                        | 175   | U  | NHH | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |   |

| Class of Equipment            | Equipment                            | Engine<br>Type<br>& Fuel | MaxHP | Commercial<br>or           |                             | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-------------------------------|--------------------------------------|--------------------------|-------|----------------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                               |                                      |                          |       | Residential<br>Application | Handheld or<br>Non-handheld |                                  |                           |                           |                           |                        |                      |
| Railyard Operations           | Generator (Railyard)                 | D                        | 9999  | U                          | NHH                         | 0                                | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Railyard Operations           | Materials Handling (Rail-CHE)        | D                        | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2                       | 15    | U                          | NHH                         | 57                               | 0.192                     | 0.004                     | 0.000                     | 409                    | 1,515                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2                       | 25    | U                          | NHH                         | 37                               | 0.125                     | 0.002                     | 0.000                     | 266                    | 986                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2                       | 50    | U                          | NHH                         | 49                               | 0.164                     | 0.003                     | 0.000                     | 351                    | 1,298                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4                       | 15    | U                          | NHH                         | 23                               | 0.157                     | 0.000                     | 0.000                     | 334                    | 1,236                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4                       | 25    | U                          | NHH                         | 325                              | 2.178                     | 0.001                     | 0.007                     | 4,645                  | 17,197               |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4                       | 50    | U                          | NHH                         | 15                               | 0.098                     | 0.000                     | 0.000                     | 210                    | 776                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 124                    | 460                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 81                     | 299                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 106                    | 394                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 101                    | 375                  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 1,410                  | 5,221                |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 64                     | 236                  |
| Recreational Equipment        | Golf Carts                           | G2                       | 15    | U                          | NHH                         | 562                              | 2.924                     | 0.002                     | 0.003                     | 494                    | 1,492                |
| Recreational Equipment        | Golf Carts                           | G4                       | 15    | U                          | NHH                         | 474                              | 2.288                     | 0.001                     | 0.002                     | 386                    | 1,168                |
| Recreational Equipment        | Minibikes                            | G4                       | 5     | U                          | NHH                         | 15                               | 0.008                     | 0.001                     | 0.000                     | 172                    | 65                   |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 15    | U                          | NHH                         | 40                               | 0.132                     | 0.002                     | 0.000                     | 282                    | 1,046                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 25    | U                          | NHH                         | 34                               | 0.114                     | 0.002                     | 0.000                     | 243                    | 900                  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 50    | U                          | NHH                         | 278                              | 0.928                     | 0.017                     | 0.000                     | 1,979                  | 7,326                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2                       | 120   | U                          | NHH                         | 133                              | 0.444                     | 0.008                     | 0.000                     | 947                    | 3,504                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4                       | 15    | U                          | NHH                         | 38                               | 0.258                     | 0.000                     | 0.001                     | 551                    | 2,039                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4                       | 25    | U                          | NHH                         | 62                               | 0.417                     | 0.000                     | 0.001                     | 889                    | 3,290                |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4                       | 50    | U                          | NHH                         | 64                               | 0.434                     | 0.000                     | 0.001                     | 926                    | 3,428                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 113                    | 419                  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 97                     | 360                  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 793                    | 2,935                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 379                    | 1,404                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4                       | 15    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 221                    | 817                  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 356                    | 1,318                |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 371                    | 1,373                |
| Recreational Equipment        | Snowmobiles Active                   | G2                       | 25    | U                          | NHH                         | 7                                | 0.029                     | 0.000                     | 0.000                     | 56                     | 9                    |
| Recreational Equipment        | Snowmobiles Active                   | G2                       | 50    | U                          | NHH                         | 59                               | 0.256                     | 0.002                     | 0.000                     | 266                    | 42                   |
| Recreational Equipment        | Snowmobiles Active                   | G2                       | 120   | U                          | NHH                         | 183                              | 0.796                     | 0.006                     | 0.000                     | 483                    | 76                   |
| Recreational Equipment        | Snowmobiles Inactive                 | G2                       | 25    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 20                     | 3                    |
| Recreational Equipment        | Snowmobiles Inactive                 | G2                       | 50    | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 92                     | 15                   |
| Recreational Equipment        | Snowmobiles Inactive                 | G2                       | 120   | U                          | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 168                    | 26                   |
| Recreational Equipment        | Specialty Vehicles Carts             | G2                       | 15    | U                          | NHH                         | 75                               | 0.393                     | 0.000                     | 0.000                     | 1,125                  | 205                  |
| Recreational Equipment        | Specialty Vehicles Carts             | G4                       | 5     | U                          | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 35                     | 6                    |
| Recreational Equipment        | Specialty Vehicles Carts             | G4                       | 15    | U                          | NHH                         | 34                               | 0.165                     | 0.000                     | 0.000                     | 472                    | 86                   |
| Recreational Equipment        | Specialty Vehicles Carts             | G4                       | 25    | U                          | NHH                         | 52                               | 0.246                     | 0.000                     | 0.000                     | 259                    | 47                   |
| Transport Refrigeration Units | Transport Refrigeration Units        | G4                       | 15    | U                          | NHH                         | 90                               | 0.438                     | 0.000                     | 0.000                     | 75                     | 154                  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D                        | 15    | U                          | NHH                         | 146                              | 1.595                     | 0.000                     | 0.000                     | 140                    | 398                  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D                        | 25    | U                          | NHH                         | 77                               | 0.849                     | 0.000                     | 0.000                     | 44                     | 125                  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D                        | 50    | U                          | NHH                         | 5,174                            | 56.576                    | 0.004                     | 0.000                     | 1,087                  | 4,369                |



Farm Equipment  
Greenhouse Gas Inventory, 2008 Base Year  
Agriculture Sector  
120 Farm Equipment.xlsx



|  | <u>CO2</u>   | <u>CH4</u>   | <u>N2O</u>    | <u>units</u> | <u>source</u>                |
|--|--------------|--------------|---------------|--------------|------------------------------|
| Avg. daily emissions from Ag equipment in Shasta County  | 66           | 0            | 0             | tons/day     | wksht: Equip class processed |
| time conversion  | 365          | 365          | 365           | days/year    | 6.0 Unit Conversions.xlsx    |
| mass conversion  | 1.1023       | 1.1023       | 1.1023        | ton/MT       | 6.0 Unit Conversions.xlsx    |
| Avg. daily emissions from Ag equipment in Shasta County  | 21,751       | 3.74         | 0.26          | MT/year      | conversion calculation       |
| global warming potential                                 | 1            | 21           | 310           | unitless     | 6.0 Unit Conversions.xlsx    |
|  | <u>value</u> | <u>units</u> | <u>source</u> |              |                              |
| Total CO2-e emissions from Ag equipment in Shasta County | 21,910       | MT/year      | calculation   |              |                              |

Notes

- 1 It is assumed that all agricultural equipment is operated in unincorporated areas of the county.



| Class of Equipment     | Equipment                    | Engine         | MaxHP | Commercial or              | Handheld or      | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) | Avg daily use<br>(hr/day/Equip Item) |
|------------------------|------------------------------|----------------|-------|----------------------------|------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--------------------------------------|
|                        |                              | Type<br>& Fuel |       | Residential<br>Application | Non-<br>handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |                                      |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 5     | U                          | NHH              | 1                        | 0.004                     | 0.000                     | 0.000                     | 8                      | 4                    | 0.44                                 |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 15    | U                          | NHH              | 4                        | 0.020                     | 0.000                     | 0.000                     | 9                      | 9                    | 0.91                                 |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 25    | U                          | NHH              | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.91                                 |
| Agricultural Equipment | Agricultural Mowers          | G4             | 15    | U                          | NHH              | 2                        | 0.008                     | 0.000                     | 0.000                     | 8                      | 4                    | 0.49                                 |
| Agricultural Equipment | Agricultural Mowers          | G4             | 25    | U                          | NHH              | 3                        | 0.014                     | 0.000                     | 0.000                     | 7                      | 3                    | 0.49                                 |
| Agricultural Equipment | Agricultural Mowers          | D              | 120   | U                          | NHH              | 1                        | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    | 1.00                                 |
| Agricultural Equipment | Agricultural Tractors        | G4             | 120   | U                          | NHH              | 25                       | 0.218                     | 0.000                     | 0.000                     | 3                      | 5                    | 1.51                                 |
| Agricultural Equipment | Agricultural Tractors        | G4             | 175   | U                          | NHH              | 5                        | 0.044                     | 0.000                     | 0.000                     | 0                      | 1                    | 1.51                                 |
| Agricultural Equipment | Agricultural Tractors        | D              | 15    | U                          | NHH              | 75                       | 0.817                     | 0.000                     | 0.000                     | 106                    | 155                  | 1.46                                 |
| Agricultural Equipment | Agricultural Tractors        | D              | 25    | U                          | NHH              | 176                      | 1.930                     | 0.000                     | 0.000                     | 131                    | 191                  | 1.46                                 |
| Agricultural Equipment | Agricultural Tractors        | D              | 50    | U                          | NHH              | 636                      | 6.812                     | 0.003                     | 0.000                     | 306                    | 398                  | 1.30                                 |
| Agricultural Equipment | Agricultural Tractors        | D              | 120   | U                          | NHH              | 1,539                    | 16.767                    | 0.003                     | 0.000                     | 353                    | 461                  | 1.30                                 |
| Agricultural Equipment | Agricultural Tractors        | D              | 175   | U                          | NHH              | 1,476                    | 16.155                    | 0.002                     | 0.000                     | 199                    | 259                  | 1.30                                 |
| Agricultural Equipment | Agricultural Tractors        | D              | 250   | U                          | NHH              | 1,355                    | 14.918                    | 0.001                     | 0.000                     | 129                    | 168                  | 1.30                                 |
| Agricultural Equipment | Agricultural Tractors        | D              | 500   | U                          | NHH              | 440                      | 4.846                     | 0.000                     | 0.000                     | 26                     | 33                   | 1.30                                 |
| Agricultural Equipment | Balers                       | G4             | 50    | U                          | NHH              | 5                        | 0.038                     | 0.000                     | 0.000                     | 12                     | 2                    | 0.19                                 |
| Agricultural Equipment | Balers                       | G4             | 120   | U                          | NHH              | 4                        | 0.035                     | 0.000                     | 0.000                     | 6                      | 1                    | 0.19                                 |
| Agricultural Equipment | Balers                       | D              | 50    | U                          | NHH              | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.26                                 |
| Agricultural Equipment | Balers                       | D              | 120   | U                          | NHH              | 6                        | 0.071                     | 0.000                     | 0.000                     | 10                     | 3                    | 0.26                                 |
| Agricultural Equipment | Combines                     | G4             | 120   | U                          | NHH              | 2                        | 0.019                     | 0.000                     | 0.000                     | 1                      | 0                    | 0.34                                 |
| Agricultural Equipment | Combines                     | G4             | 175   | U                          | NHH              | 2                        | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.34                                 |
| Agricultural Equipment | Combines                     | G4             | 250   | U                          | NHH              | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.34                                 |
| Agricultural Equipment | Combines                     | D              | 120   | U                          | NHH              | 13                       | 0.145                     | 0.000                     | 0.000                     | 7                      | 3                    | 0.41                                 |
| Agricultural Equipment | Combines                     | D              | 175   | U                          | NHH              | 26                       | 0.284                     | 0.000                     | 0.000                     | 11                     | 5                    | 0.41                                 |
| Agricultural Equipment | Combines                     | D              | 250   | U                          | NHH              | 39                       | 0.427                     | 0.000                     | 0.000                     | 12                     | 5                    | 0.41                                 |
| Agricultural Equipment | Combines                     | D              | 500   | U                          | NHH              | 2                        | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.41                                 |
| Agricultural Equipment | Hydro Power Units            | G4             | 5     | U                          | NHH              | 0                        | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    | 0.48                                 |
| Agricultural Equipment | Hydro Power Units            | G4             | 15    | U                          | NHH              | 2                        | 0.010                     | 0.000                     | 0.000                     | 4                      | 5                    | 1.27                                 |
| Agricultural Equipment | Hydro Power Units            | G4             | 25    | U                          | NHH              | 2                        | 0.008                     | 0.000                     | 0.000                     | 1                      | 2                    | 1.27                                 |
| Agricultural Equipment | Hydro Power Units            | G4             | 50    | U                          | NHH              | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    | 1.23                                 |
| Agricultural Equipment | Hydro Power Units            | G4             | 120   | U                          | NHH              | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    | 1.23                                 |
| Agricultural Equipment | Hydro Power Units            | D              | 15    | U                          | NHH              | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    | 2.23                                 |
| Agricultural Equipment | Hydro Power Units            | D              | 25    | U                          | NHH              | 1                        | 0.016                     | 0.000                     | 0.000                     | 1                      | 3                    | 2.23                                 |
| Agricultural Equipment | Hydro Power Units            | D              | 50    | U                          | NHH              | 3                        | 0.032                     | 0.000                     | 0.000                     | 1                      | 3                    | 2.17                                 |
| Agricultural Equipment | Hydro Power Units            | D              | 120   | U                          | NHH              | 1                        | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    | 2.17                                 |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 5     | U                          | NHH              | 0                        | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    | 0.40                                 |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 15    | U                          | NHH              | 0                        | 0.001                     | 0.000                     | 0.000                     | 1                      | 0                    | 0.40                                 |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 25    | U                          | NHH              | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.40                                 |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 50    | U                          | NHH              | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.34                                 |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 120   | U                          | NHH              | 3                        | 0.023                     | 0.000                     | 0.000                     | 2                      | 1                    | 0.34                                 |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 175   | U                          | NHH              | 1                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.34                                 |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 250   | U                          | NHH              | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    | 0.34                                 |
| Agricultural Equipment | Other Agricultural Equipment | D              | 15    | U                          | NHH              | 1                        | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    | 1.22                                 |
| Agricultural Equipment | Other Agricultural Equipment | D              | 25    | U                          | NHH              | 3                        | 0.036                     | 0.000                     | 0.000                     | 4                      | 5                    | 1.22                                 |
| Agricultural Equipment | Other Agricultural Equipment | D              | 50    | U                          | NHH              | 5                        | 0.049                     | 0.000                     | 0.000                     | 4                      | 4                    | 1.05                                 |
| Agricultural Equipment | Other Agricultural Equipment | D              | 120   | U                          | NHH              | 30                       | 0.329                     | 0.000                     | 0.000                     | 12                     | 13                   | 1.05                                 |
| Agricultural Equipment | Other Agricultural Equipment | D              | 175   | U                          | NHH              | 5                        | 0.050                     | 0.000                     | 0.000                     | 1                      | 1                    | 1.05                                 |
| Agricultural Equipment | Other Agricultural Equipment | D              | 250   | U                          | NHH              | 7                        | 0.072                     | 0.000                     | 0.000                     | 1                      | 1                    | 1.05                                 |
| Agricultural Equipment | Other Agricultural Equipment | D              | 500   | U                          | NHH              | 2                        | 0.025                     | 0.000                     | 0.000                     | 0                      | 0                    | 1.05                                 |
| Agricultural Equipment | Sprayers                     | G4             | 5     | U                          | NHH              | 1                        | 0.008                     | 0.000                     | 0.000                     | 32                     | 9                    | 0.27                                 |
| Agricultural Equipment | Sprayers                     | G4             | 15    | U                          | NHH              | 1                        | 0.004                     | 0.000                     | 0.000                     | 10                     | 3                    | 0.27                                 |

| Class of Equipment     |          | Equipment | Engine Type & Fuel | MaxHP | Commercial or Residential Application | Handheld or Non-handheld | Fuel Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) | Number of Equipment | Activity (hr/day) | Avg daily use (hr/day/Equip Item) |
|------------------------|----------|-----------|--------------------|-------|---------------------------------------|--------------------------|----------------------------|------------------------|------------------------|------------------------|---------------------|-------------------|-----------------------------------|
| Agricultural Equipment | Sprayers |           | G4                 | 25    | U                                     | NHH                      | 7                          | 0.028                  | 0.000                  | 0.000                  | 26                  | 7                 | 0.27                              |
| Agricultural Equipment | Sprayers |           | G4                 | 50    | U                                     | NHH                      | 1                          | 0.007                  | 0.000                  | 0.000                  | 2                   | 1                 | 0.22                              |
| Agricultural Equipment | Sprayers |           | G4                 | 120   | U                                     | NHH                      | 3                          | 0.025                  | 0.000                  | 0.000                  | 4                   | 1                 | 0.22                              |
| Agricultural Equipment | Sprayers |           | G4                 | 175   | U                                     | NHH                      | 1                          | 0.011                  | 0.000                  | 0.000                  | 1                   | 0                 | 0.22                              |
| Agricultural Equipment | Sprayers |           | D                  | 25    | U                                     | NHH                      | 0                          | 0.004                  | 0.000                  | 0.000                  | 2                   | 1                 | 0.30                              |
| Agricultural Equipment | Sprayers |           | D                  | 50    | U                                     | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 | 0.25                              |
| Agricultural Equipment | Sprayers |           | D                  | 120   | U                                     | NHH                      | 3                          | 0.033                  | 0.000                  | 0.000                  | 5                   | 1                 | 0.25                              |
| Agricultural Equipment | Sprayers |           | D                  | 175   | U                                     | NHH                      | 2                          | 0.023                  | 0.000                  | 0.000                  | 2                   | 0                 | 0.25                              |
| Agricultural Equipment | Sprayers |           | D                  | 250   | U                                     | NHH                      | 2                          | 0.024                  | 0.000                  | 0.000                  | 1                   | 0                 | 0.25                              |
| Agricultural Equipment | Sprayers |           | D                  | 500   | U                                     | NHH                      | 0                          | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 | 0.25                              |
| Agricultural Equipment | Swathers |           | G4                 | 120   | U                                     | NHH                      | 14                         | 0.127                  | 0.000                  | 0.000                  | 12                  | 3                 | 0.26                              |
| Agricultural Equipment | Swathers |           | G4                 | 175   | U                                     | NHH                      | 15                         | 0.138                  | 0.000                  | 0.000                  | 10                  | 2                 | 0.26                              |
| Agricultural Equipment | Swathers |           | D                  | 120   | U                                     | NHH                      | 40                         | 0.436                  | 0.000                  | 0.000                  | 54                  | 16                | 0.30                              |
| Agricultural Equipment | Swathers |           | D                  | 175   | U                                     | NHH                      | 1                          | 0.007                  | 0.000                  | 0.000                  | 0                   | 0                 | 0.30                              |
| Agricultural Equipment | Tillers  |           | G4                 | 15    | U                                     | NHH                      | 115                        | 0.499                  | 0.001                  | 0.000                  | 1,088               | 212               | 0.19                              |
| Agricultural Equipment | Tillers  |           | D                  | 15    | U                                     | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 | 0.72                              |
| Agricultural Equipment | Tillers  |           | D                  | 250   | U                                     | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 | 0.47                              |
| Agricultural Equipment | Tillers  |           | D                  | 500   | U                                     | NHH                      | 0                          | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 | 0.47                              |
| Daily Total            |          |           | NA                 | NA    | NA                                    | NA                       | 6,111                      | 66                     | 0                      | 0                      | 2,637               | 2,011             | NA                                |

Notes

Non-shaded cells are from ARB's OFFROAD2007 model, which is Ref 03.

Grey-shaded cells are calculations using the output data from the OFFROAD model.



| Class of Equipment     | Equipment                    | Engine         | MaxHP | Commercial or              |                             | Fuel  | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|------------------------|------------------------------|----------------|-------|----------------------------|-----------------------------|-------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                        |                              | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |       |                           |                           |                           |                        |                      |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 5     | U                          | NHH                         | 1     | 0.004                     | 0.000                     | 0.000                     | 8                      | 4                    |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 15    | U                          | NHH                         | 4     | 0.020                     | 0.000                     | 0.000                     | 9                      | 9                    |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 25    | U                          | NHH                         | 0     | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Agricultural Mowers          | G4             | 15    | U                          | NHH                         | 2     | 0.008                     | 0.000                     | 0.000                     | 8                      | 4                    |
| Agricultural Equipment | Agricultural Mowers          | G4             | 25    | U                          | NHH                         | 3     | 0.014                     | 0.000                     | 0.000                     | 7                      | 3                    |
| Agricultural Equipment | Agricultural Mowers          | D              | 120   | U                          | NHH                         | 1     | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Agricultural Tractors        | G4             | 120   | U                          | NHH                         | 25    | 0.218                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Agricultural Equipment | Agricultural Tractors        | G4             | 175   | U                          | NHH                         | 5     | 0.044                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Agricultural Equipment | Agricultural Tractors        | D              | 15    | U                          | NHH                         | 75    | 0.817                     | 0.000                     | 0.000                     | 106                    | 155                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 25    | U                          | NHH                         | 176   | 1.930                     | 0.000                     | 0.000                     | 131                    | 191                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 50    | U                          | NHH                         | 636   | 6.812                     | 0.003                     | 0.000                     | 306                    | 398                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 120   | U                          | NHH                         | 1,539 | 16.767                    | 0.003                     | 0.000                     | 353                    | 461                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 175   | U                          | NHH                         | 1,476 | 16.155                    | 0.002                     | 0.000                     | 199                    | 259                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 250   | U                          | NHH                         | 1,355 | 14.918                    | 0.001                     | 0.000                     | 129                    | 168                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 500   | U                          | NHH                         | 440   | 4.846                     | 0.000                     | 0.000                     | 26                     | 33                   |
| Agricultural Equipment | Balers                       | G4             | 50    | U                          | NHH                         | 5     | 0.038                     | 0.000                     | 0.000                     | 12                     | 2                    |
| Agricultural Equipment | Balers                       | G4             | 120   | U                          | NHH                         | 4     | 0.035                     | 0.000                     | 0.000                     | 6                      | 1                    |
| Agricultural Equipment | Balers                       | D              | 50    | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Balers                       | D              | 120   | U                          | NHH                         | 6     | 0.071                     | 0.000                     | 0.000                     | 10                     | 3                    |
| Agricultural Equipment | Combines                     | G4             | 120   | U                          | NHH                         | 2     | 0.019                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment | Combines                     | G4             | 175   | U                          | NHH                         | 2     | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Combines                     | G4             | 250   | U                          | NHH                         | 0     | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Combines                     | D              | 120   | U                          | NHH                         | 13    | 0.145                     | 0.000                     | 0.000                     | 7                      | 3                    |
| Agricultural Equipment | Combines                     | D              | 175   | U                          | NHH                         | 26    | 0.284                     | 0.000                     | 0.000                     | 11                     | 5                    |
| Agricultural Equipment | Combines                     | D              | 250   | U                          | NHH                         | 39    | 0.427                     | 0.000                     | 0.000                     | 12                     | 5                    |
| Agricultural Equipment | Combines                     | D              | 500   | U                          | NHH                         | 2     | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 5     | U                          | NHH                         | 0     | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 15    | U                          | NHH                         | 2     | 0.010                     | 0.000                     | 0.000                     | 4                      | 5                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 25    | U                          | NHH                         | 2     | 0.008                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 50    | U                          | NHH                         | 0     | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 120   | U                          | NHH                         | 0     | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | D              | 15    | U                          | NHH                         | 0     | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Agricultural Equipment | Hydro Power Units            | D              | 25    | U                          | NHH                         | 1     | 0.016                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Agricultural Equipment | Hydro Power Units            | D              | 50    | U                          | NHH                         | 3     | 0.032                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Agricultural Equipment | Hydro Power Units            | D              | 120   | U                          | NHH                         | 1     | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 5     | U                          | NHH                         | 0     | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 15    | U                          | NHH                         | 0     | 0.001                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 25    | U                          | NHH                         | 0     | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 50    | U                          | NHH                         | 0     | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 120   | U                          | NHH                         | 3     | 0.023                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 175   | U                          | NHH                         | 1     | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 250   | U                          | NHH                         | 0     | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 15    | U                          | NHH                         | 1     | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 25    | U                          | NHH                         | 3     | 0.036                     | 0.000                     | 0.000                     | 4                      | 5                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 50    | U                          | NHH                         | 5     | 0.049                     | 0.000                     | 0.000                     | 4                      | 4                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 120   | U                          | NHH                         | 30    | 0.329                     | 0.000                     | 0.000                     | 12                     | 13                   |
| Agricultural Equipment | Other Agricultural Equipment | D              | 175   | U                          | NHH                         | 5     | 0.050                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 250   | U                          | NHH                         | 7     | 0.072                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 500   | U                          | NHH                         | 2     | 0.025                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Sprayers                     | G4             | 5     | U                          | NHH                         | 1     | 0.008                     | 0.000                     | 0.000                     | 32                     | 9                    |
| Agricultural Equipment | Sprayers                     | G4             | 15    | U                          | NHH                         | 1     | 0.004                     | 0.000                     | 0.000                     | 10                     | 3                    |



| Class of Equipment               | Equipment           | Engine         | MaxHP | Commercial or              |                             | Fuel | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------------|---------------------|----------------|-------|----------------------------|-----------------------------|------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                  |                     | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |      |                           |                           |                           |                        |                      |
| Agricultural Equipment           | Sprayers            | G4             | 25    | U                          | NHH                         | 7    | 0.028                     | 0.000                     | 0.000                     | 26                     | 7                    |
| Agricultural Equipment           | Sprayers            | G4             | 50    | U                          | NHH                         | 1    | 0.007                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment           | Sprayers            | G4             | 120   | U                          | NHH                         | 3    | 0.025                     | 0.000                     | 0.000                     | 4                      | 1                    |
| Agricultural Equipment           | Sprayers            | G4             | 175   | U                          | NHH                         | 1    | 0.011                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 25    | U                          | NHH                         | 0    | 0.004                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment           | Sprayers            | D              | 50    | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 120   | U                          | NHH                         | 3    | 0.033                     | 0.000                     | 0.000                     | 5                      | 1                    |
| Agricultural Equipment           | Sprayers            | D              | 175   | U                          | NHH                         | 2    | 0.023                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 250   | U                          | NHH                         | 2    | 0.024                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 500   | U                          | NHH                         | 0    | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Swathers            | G4             | 120   | U                          | NHH                         | 14   | 0.127                     | 0.000                     | 0.000                     | 12                     | 3                    |
| Agricultural Equipment           | Swathers            | G4             | 175   | U                          | NHH                         | 15   | 0.138                     | 0.000                     | 0.000                     | 10                     | 2                    |
| Agricultural Equipment           | Swathers            | D              | 120   | U                          | NHH                         | 40   | 0.436                     | 0.000                     | 0.000                     | 54                     | 16                   |
| Agricultural Equipment           | Swathers            | D              | 175   | U                          | NHH                         | 1    | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Tillers             | G4             | 15    | U                          | NHH                         | 115  | 0.499                     | 0.001                     | 0.000                     | 1,088                  | 212                  |
| Agricultural Equipment           | Tillers             | D              | 15    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Tillers             | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Tillers             | D              | 500   | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | A/C Tug Narrow Body | G4             | 175   | U                          | NHH                         | 1    | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | A/C Tug Narrow Body | D              | 250   | U                          | NHH                         | 4    | 0.047                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment | A/C Tug Wide Body   | G4             | 500   | U                          | NHH                         | 1    | 0.010                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | A/C Tug Wide Body   | D              | 500   | U                          | NHH                         | 2    | 0.026                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | G4             | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | C4             | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | D              | 175   | U                          | NHH                         | 1    | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | D              | 250   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | D              | 500   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | G4             | 175   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 500   | U                          | NHH                         | 3    | 0.030                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 750   | U                          | NHH                         | 1    | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Baggage Tug         | G4             | 120   | U                          | NHH                         | 12   | 0.103                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Airport Ground Support Equipment | Baggage Tug         | C4             | 120   | U                          | NHH                         | 3    | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Baggage Tug         | D              | 120   | U                          | NHH                         | 5    | 0.058                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Airport Ground Support Equipment | Belt Loader         | G4             | 120   | U                          | NHH                         | 3    | 0.025                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment | Belt Loader         | C4             | 120   | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Belt Loader         | D              | 120   | U                          | NHH                         | 1    | 0.014                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment | Bobtail             | G4             | 120   | U                          | NHH                         | 2    | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Bobtail             | C4             | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Bobtail             | D              | 120   | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Loader        | G4             | 120   | U                          | NHH                         | 1    | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Loader        | C4             | 120   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Loader        | D              | 120   | U                          | NHH                         | 3    | 0.028                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment | Cargo Tractor       | G4             | 120   | U                          | NHH                         | 14   | 0.115                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Airport Ground Support Equipment | Cargo Tractor       | C4             | 175   | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Tractor       | D              | 120   | U                          | NHH                         | 1    | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cart                | G4             | 15    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Catering Truck      | G4             | 250   | U                          | NHH                         | 2    | 0.019                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Catering Truck      | C4             | 250   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Catering Truck      | D              | 250   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment                | Equipment         | Engine         | MaxHP | Commercial or              |                             | Fuel | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|-------------------|----------------|-------|----------------------------|-----------------------------|------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                   | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |      |                           |                           |                           |                        |                      |
| Airport Ground Support Equipment  | Compressor (GSE)  | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Compressor (GSE)  | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Compressor (GSE)  | D              | 500   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Compressor (GSE)  | D              | 750   | U                          | NHH                         | 1    | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Deicer            | G4             | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Forklift          | G4             | 50    | U                          | NHH                         | 0    | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Forklift          | C4             | 50    | U                          | NHH                         | 1    | 0.006                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment  | Forklift          | D              | 175   | U                          | NHH                         | 0    | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Fuel Truck        | G4             | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Fuel Truck        | C4             | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Fuel Truck        | D              | 250   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Generator         | G4             | 120   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Generator         | D              | 120   | U                          | NHH                         | 0    | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Generator         | D              | 175   | U                          | NHH                         | 3    | 0.037                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Generator         | D              | 250   | U                          | NHH                         | 5    | 0.055                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Generator         | D              | 500   | U                          | NHH                         | 1    | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Generator         | D              | 750   | U                          | NHH                         | 2    | 0.020                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Ground Power Unit | G4             | 175   | U                          | NHH                         | 2    | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Ground Power Unit | D              | 175   | U                          | NHH                         | 8    | 0.082                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment  | Hydrant truck     | G4             | 175   | U                          | NHH                         | 2    | 0.019                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Hydrant Truck     | D              | 175   | U                          | NHH                         | 0    | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Lav Cart          | G4             | 15    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Lav Truck         | G4             | 175   | U                          | NHH                         | 1    | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Lav Truck         | C4             | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Lav Truck         | D              | 175   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Lift              | G4             | 120   | U                          | NHH                         | 1    | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Lift              | C4             | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Lift              | D              | 120   | U                          | NHH                         | 0    | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Maint. Truck      | G4             | 175   | U                          | NHH                         | 1    | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Other             | C4             | 50    | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Other GSE         | G4             | 50    | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Other GSE         | D              | 175   | U                          | NHH                         | 1    | 0.013                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Passenger Stand   | G4             | 175   | U                          | NHH                         | 0    | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Passenger Stand   | C4             | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Passenger Stand   | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Service Truck     | G4             | 250   | U                          | NHH                         | 3    | 0.026                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment  | Service Truck     | C4             | 250   | U                          | NHH                         | 1    | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Service Truck     | D              | 175   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Sweeper           | G4             | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Sweeper           | C4             | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Sweeper           | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment  | Water Truck       | G4             | 175   | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Asphalt Pavers    | G4             | 15    | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Asphalt Pavers    | G4             | 25    | U                          | NHH                         | 1    | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Asphalt Pavers    | G4             | 50    | U                          | NHH                         | 1    | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Asphalt Pavers    | G4             | 120   | U                          | NHH                         | 1    | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4             | 15    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4             | 25    | U                          | NHH                         | 1    | 0.003                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4             | 50    | U                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4             | 120   | U                          | NHH                         | 1    | 0.011                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4             | 175   | U                          | NHH                         | 0    | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |





| Class of Equipment                | Equipment                | Engine         | MaxHP | Commercial or              | Handheld or<br>Non-handheld | Fuel | Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|--------------------------|----------------|-------|----------------------------|-----------------------------|------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                          | Type<br>& Fuel |       | Residential<br>Application |                             |      |                          |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 15    | U                          | NHH                         |      | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 25    | U                          | NHH                         |      | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 50    | U                          | NHH                         |      | 3                        | 0.035                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 120   | U                          | NHH                         |      | 24                       | 0.265                     | 0.000                     | 0.000                     | 3                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 175   | U                          | NHH                         |      | 10                       | 0.112                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 250   | U                          | NHH                         |      | 12                       | 0.129                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 500   | U                          | NHH                         |      | 43                       | 0.474                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 750   | U                          | NHH                         |      | 48                       | 0.530                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Bore/Drill Rigs          | D              | 1000  | U                          | NHH                         |      | 122                      | 1.342                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4             | 5     | U                          | NHH                         |      | 5                        | 0.026                     | 0.000                     | 0.000                     | 75                     | 1                    |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4             | 15    | U                          | NHH                         |      | 17                       | 0.072                     | 0.000                     | 0.000                     | 127                    | 3                    |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4             | 25    | U                          | NHH                         |      | 0                        | 0.001                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Cement and Mortar Mixers | D              | 15    | U                          | NHH                         |      | 1                        | 0.010                     | 0.000                     | 0.000                     | 4                      |                      |
| Construction and Mining Equipment | Cement and Mortar Mixers | D              | 25    | U                          | NHH                         |      | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 5     | U                          | NHH                         |      | 0                        | 0.002                     | 0.000                     | 0.000                     | 4                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 15    | U                          | NHH                         |      | 11                       | 0.052                     | 0.000                     | 0.000                     | 19                     | 1                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 25    | U                          | NHH                         |      | 7                        | 0.031                     | 0.000                     | 0.000                     | 6                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 50    | U                          | NHH                         |      | 2                        | 0.021                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 120   | U                          | NHH                         |      | 2                        | 0.022                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 25    | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 50    | U                          | NHH                         |      | 1                        | 0.006                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 120   | U                          | NHH                         |      | 2                        | 0.027                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 175   | U                          | NHH                         |      | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Cranes                   | G4             | 50    | U                          | NHH                         |      | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Cranes                   | G4             | 120   | U                          | NHH                         |      | 1                        | 0.011                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Cranes                   | G4             | 175   | U                          | NHH                         |      | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Cranes                   | D              | 50    | U                          | NHH                         |      | 1                        | 0.010                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Cranes                   | D              | 120   | U                          | NHH                         |      | 22                       | 0.242                     | 0.000                     | 0.000                     | 3                      | 1                    |
| Construction and Mining Equipment | Cranes                   | D              | 175   | U                          | NHH                         |      | 36                       | 0.388                     | 0.000                     | 0.000                     | 3                      | 1                    |
| Construction and Mining Equipment | Cranes                   | D              | 250   | U                          | NHH                         |      | 96                       | 1.050                     | 0.000                     | 0.000                     | 5                      | 1                    |
| Construction and Mining Equipment | Cranes                   | D              | 500   | U                          | NHH                         |      | 56                       | 0.618                     | 0.000                     | 0.000                     | 2                      |                      |
| Construction and Mining Equipment | Cranes                   | D              | 750   | U                          | NHH                         |      | 76                       | 0.829                     | 0.000                     | 0.000                     | 2                      |                      |
| Construction and Mining Equipment | Cranes                   | D              | 9999  | U                          | NHH                         |      | 304                      | 3.332                     | 0.000                     | 0.000                     | 2                      |                      |
| Construction and Mining Equipment | Crawler Tractors         | D              | 50    | U                          | NHH                         |      | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Crawler Tractors         | D              | 120   | U                          | NHH                         |      | 514                      | 5.582                     | 0.001                     | 0.000                     | 59                     | 17                   |
| Construction and Mining Equipment | Crawler Tractors         | D              | 175   | U                          | NHH                         |      | 319                      | 3.478                     | 0.001                     | 0.000                     | 20                     | 5                    |
| Construction and Mining Equipment | Crawler Tractors         | D              | 250   | U                          | NHH                         |      | 373                      | 4.098                     | 0.001                     | 0.000                     | 17                     | 4                    |
| Construction and Mining Equipment | Crawler Tractors         | D              | 500   | U                          | NHH                         |      | 400                      | 4.382                     | 0.000                     | 0.000                     | 12                     | 3                    |
| Construction and Mining Equipment | Crawler Tractors         | D              | 750   | U                          | NHH                         |      | 39                       | 0.430                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Crawler Tractors         | D              | 1000  | U                          | NHH                         |      | 56                       | 0.608                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4             | 15    | U                          | NHH                         |      | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4             | 25    | U                          | NHH                         |      | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4             | 120   | U                          | NHH                         |      | 1                        | 0.009                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 50    | U                          | NHH                         |      | 6                        | 0.068                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 120   | U                          | NHH                         |      | 33                       | 0.362                     | 0.000                     | 0.000                     | 3                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 175   | U                          | NHH                         |      | 28                       | 0.309                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 250   | U                          | NHH                         |      | 4                        | 0.045                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 500   | U                          | NHH                         |      | 35                       | 0.386                     | 0.000                     | 0.000                     | 1                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 750   | U                          | NHH                         |      | 3                        | 0.031                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 9999  | U                          | NHH                         |      | 6                        | 0.068                     | 0.000                     | 0.000                     | 0                      |                      |
| Construction and Mining Equipment | Dumpers/Tenders          | G4             | 5     | U                          | NHH                         |      | 0                        | 0.001                     | 0.000                     | 0.000                     | 4                      |                      |



| Class of Equipment                | Equipment                    | Engine      | MaxHP | Commercial or           |                          | Fuel                  |                        |                        |                        | Number of Equipment | Activity (hr/day) |
|-----------------------------------|------------------------------|-------------|-------|-------------------------|--------------------------|-----------------------|------------------------|------------------------|------------------------|---------------------|-------------------|
|                                   |                              | Type & Fuel |       | Residential Application | Handheld or Non-handheld | Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) |                     |                   |
| Construction and Mining Equipment | Dumpers/Tenders              | G4          | 15    | U                       | NHH                      | 1                     | 0.006                  | 0.000                  | 0.000                  | 8                   | 3                 |
| Construction and Mining Equipment | Dumpers/Tenders              | G4          | 25    | U                       | NHH                      | 1                     | 0.002                  | 0.000                  | 0.000                  | 2                   | 1                 |
| Construction and Mining Equipment | Dumpers/Tenders              | G4          | 120   | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Dumpers/Tenders              | D           | 25    | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Excavators                   | D           | 25    | U                       | NHH                      | 1                     | 0.009                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Construction and Mining Equipment | Excavators                   | D           | 50    | U                       | NHH                      | 47                    | 0.502                  | 0.000                  | 0.000                  | 10                  | 40                |
| Construction and Mining Equipment | Excavators                   | D           | 120   | U                       | NHH                      | 369                   | 4.011                  | 0.001                  | 0.000                  | 28                  | 109               |
| Construction and Mining Equipment | Excavators                   | D           | 175   | U                       | NHH                      | 1,079                 | 11.794                 | 0.002                  | 0.000                  | 54                  | 210               |
| Construction and Mining Equipment | Excavators                   | D           | 250   | U                       | NHH                      | 616                   | 6.782                  | 0.001                  | 0.000                  | 22                  | 86                |
| Construction and Mining Equipment | Excavators                   | D           | 500   | U                       | NHH                      | 655                   | 7.207                  | 0.001                  | 0.000                  | 16                  | 62                |
| Construction and Mining Equipment | Excavators                   | D           | 750   | U                       | NHH                      | 26                    | 0.284                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Construction and Mining Equipment | Graders                      | D           | 50    | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Graders                      | D           | 120   | U                       | NHH                      | 62                    | 0.677                  | 0.000                  | 0.000                  | 7                   | 18                |
| Construction and Mining Equipment | Graders                      | D           | 175   | U                       | NHH                      | 350                   | 3.826                  | 0.001                  | 0.000                  | 24                  | 62                |
| Construction and Mining Equipment | Graders                      | D           | 250   | U                       | NHH                      | 300                   | 3.297                  | 0.000                  | 0.000                  | 15                  | 38                |
| Construction and Mining Equipment | Graders                      | D           | 500   | U                       | NHH                      | 11                    | 0.124                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Construction and Mining Equipment | Graders                      | D           | 750   | U                       | NHH                      | 1                     | 0.015                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 120   | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 175   | U                       | NHH                      | 166                   | 1.812                  | 0.000                  | 0.000                  | 9                   | 28                |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 250   | U                       | NHH                      | 156                   | 1.713                  | 0.000                  | 0.000                  | 9                   | 26                |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 750   | U                       | NHH                      | 321                   | 3.510                  | 0.000                  | 0.000                  | 4                   | 12                |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 1000  | U                       | NHH                      | 49                    | 0.531                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 175   | U                       | NHH                      | 15                    | 0.164                  | 0.000                  | 0.000                  | 0                   | 3                 |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 250   | U                       | NHH                      | 146                   | 1.610                  | 0.000                  | 0.000                  | 4                   | 19                |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 500   | U                       | NHH                      | 337                   | 3.707                  | 0.000                  | 0.000                  | 5                   | 27                |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 750   | U                       | NHH                      | 551                   | 6.059                  | 0.001                  | 0.000                  | 5                   | 27                |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 1000  | U                       | NHH                      | 365                   | 4.015                  | 0.000                  | 0.000                  | 2                   | 13                |
| Construction and Mining Equipment | Other Construction Equipment | G4          | 175   | U                       | NHH                      | 3                     | 0.023                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Other Construction Equipment | D           | 15    | U                       | NHH                      | 2                     | 0.023                  | 0.000                  | 0.000                  | 2                   | 5                 |
| Construction and Mining Equipment | Other Construction Equipment | D           | 25    | U                       | NHH                      | 0                     | 0.005                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Construction and Mining Equipment | Other Construction Equipment | D           | 50    | U                       | NHH                      | 2                     | 0.017                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Construction and Mining Equipment | Other Construction Equipment | D           | 120   | U                       | NHH                      | 8                     | 0.082                  | 0.000                  | 0.000                  | 1                   | 2                 |
| Construction and Mining Equipment | Other Construction Equipment | D           | 175   | U                       | NHH                      | 14                    | 0.149                  | 0.000                  | 0.000                  | 1                   | 3                 |
| Construction and Mining Equipment | Other Construction Equipment | D           | 500   | U                       | NHH                      | 75                    | 0.824                  | 0.000                  | 0.000                  | 3                   | 6                 |
| Construction and Mining Equipment | Pavers                       | D           | 25    | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Pavers                       | D           | 50    | U                       | NHH                      | 20                    | 0.207                  | 0.000                  | 0.000                  | 6                   | 15                |
| Construction and Mining Equipment | Pavers                       | D           | 120   | U                       | NHH                      | 56                    | 0.602                  | 0.000                  | 0.000                  | 8                   | 17                |
| Construction and Mining Equipment | Pavers                       | D           | 175   | U                       | NHH                      | 64                    | 0.694                  | 0.000                  | 0.000                  | 5                   | 11                |
| Construction and Mining Equipment | Pavers                       | D           | 250   | U                       | NHH                      | 12                    | 0.127                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Construction and Mining Equipment | Pavers                       | D           | 500   | U                       | NHH                      | 14                    | 0.156                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Construction and Mining Equipment | Paving Equipment             | G4          | 5     | U                       | NHH                      | 5                     | 0.027                  | 0.000                  | 0.000                  | 53                  | 25                |
| Construction and Mining Equipment | Paving Equipment             | G4          | 15    | U                       | NHH                      | 29                    | 0.137                  | 0.000                  | 0.000                  | 89                  | 49                |
| Construction and Mining Equipment | Paving Equipment             | G4          | 25    | U                       | NHH                      | 1                     | 0.007                  | 0.000                  | 0.000                  | 2                   | 1                 |
| Construction and Mining Equipment | Paving Equipment             | G4          | 50    | U                       | NHH                      | 1                     | 0.011                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Construction and Mining Equipment | Paving Equipment             | G4          | 120   | U                       | NHH                      | 1                     | 0.005                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Paving Equipment             | D           | 25    | U                       | NHH                      | 0                     | 0.003                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Paving Equipment             | D           | 50    | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Paving Equipment             | D           | 120   | U                       | NHH                      | 13                    | 0.146                  | 0.000                  | 0.000                  | 2                   | 5                 |
| Construction and Mining Equipment | Paving Equipment             | D           | 175   | U                       | NHH                      | 12                    | 0.128                  | 0.000                  | 0.000                  | 1                   | 3                 |
| Construction and Mining Equipment | Paving Equipment             | D           | 250   | U                       | NHH                      | 4                     | 0.044                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Construction and Mining Equipment | Plate Compactors             | G2          | 15    | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 2                   | 1                 |



| Class of Equipment                | Equipment               | Engine         | MaxHP | Commercial or              | Handheld or<br>Non-handheld | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|-------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                         | Type<br>& Fuel |       | Residential<br>Application |                             | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Plate Compactors        | G4             | 5     | U                          | NHH                         | 3                        | 0.019                     | 0.000                     | 0.000                     | 38                     | 19                   |
| Construction and Mining Equipment | Plate Compactors        | G4             | 15    | U                          | NHH                         | 10                       | 0.047                     | 0.000                     | 0.000                     | 40                     | 23                   |
| Construction and Mining Equipment | Plate Compactors        | D              | 15    | U                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Rollers                 | G4             | 5     | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 4                      | 1                    |
| Construction and Mining Equipment | Rollers                 | G4             | 15    | U                          | NHH                         | 3                        | 0.015                     | 0.000                     | 0.000                     | 7                      | 6                    |
| Construction and Mining Equipment | Rollers                 | G4             | 25    | U                          | NHH                         | 5                        | 0.022                     | 0.000                     | 0.000                     | 5                      | 4                    |
| Construction and Mining Equipment | Rollers                 | G4             | 50    | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rollers                 | G4             | 120   | U                          | NHH                         | 5                        | 0.041                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rollers                 | D              | 15    | U                          | NHH                         | 2                        | 0.027                     | 0.000                     | 0.000                     | 4                      | 9                    |
| Construction and Mining Equipment | Rollers                 | D              | 25    | U                          | NHH                         | 2                        | 0.024                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Rollers                 | D              | 50    | U                          | NHH                         | 14                       | 0.145                     | 0.000                     | 0.000                     | 6                      | 11                   |
| Construction and Mining Equipment | Rollers                 | D              | 120   | U                          | NHH                         | 163                      | 1.768                     | 0.000                     | 0.000                     | 31                     | 60                   |
| Construction and Mining Equipment | Rollers                 | D              | 175   | U                          | NHH                         | 119                      | 1.304                     | 0.000                     | 0.000                     | 13                     | 24                   |
| Construction and Mining Equipment | Rollers                 | D              | 250   | U                          | NHH                         | 24                       | 0.262                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Construction and Mining Equipment | Rollers                 | D              | 500   | U                          | NHH                         | 24                       | 0.263                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Rough Terrain Forklifts | G4             | 50    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts | G4             | 120   | U                          | NHH                         | 5                        | 0.047                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rough Terrain Forklifts | G4             | 175   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts | D              | 50    | U                          | NHH                         | 4                        | 0.043                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Rough Terrain Forklifts | D              | 120   | U                          | NHH                         | 350                      | 3.809                     | 0.001                     | 0.000                     | 39                     | 122                  |
| Construction and Mining Equipment | Rough Terrain Forklifts | D              | 175   | U                          | NHH                         | 89                       | 0.976                     | 0.000                     | 0.000                     | 5                      | 16                   |
| Construction and Mining Equipment | Rough Terrain Forklifts | D              | 250   | U                          | NHH                         | 7                        | 0.074                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rough Terrain Forklifts | D              | 500   | U                          | NHH                         | 7                        | 0.074                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rubber Tired Dozers     | D              | 175   | U                          | NHH                         | 2                        | 0.021                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Dozers     | D              | 250   | U                          | NHH                         | 68                       | 0.745                     | 0.000                     | 0.000                     | 2                      | 8                    |
| Construction and Mining Equipment | Rubber Tired Dozers     | D              | 500   | U                          | NHH                         | 152                      | 1.655                     | 0.000                     | 0.000                     | 3                      | 13                   |
| Construction and Mining Equipment | Rubber Tired Dozers     | D              | 750   | U                          | NHH                         | 87                       | 0.952                     | 0.000                     | 0.000                     | 1                      | 5                    |
| Construction and Mining Equipment | Rubber Tired Dozers     | D              | 1000  | U                          | NHH                         | 9                        | 0.096                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Loaders    | G4             | 50    | U                          | NHH                         | 1                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Loaders    | G4             | 120   | U                          | NHH                         | 6                        | 0.049                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 25    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 50    | U                          | NHH                         | 8                        | 0.084                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 120   | U                          | NHH                         | 396                      | 4.302                     | 0.001                     | 0.000                     | 55                     | 146                  |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 175   | U                          | NHH                         | 400                      | 4.376                     | 0.001                     | 0.000                     | 31                     | 82                   |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 250   | U                          | NHH                         | 554                      | 6.098                     | 0.001                     | 0.000                     | 31                     | 82                   |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 500   | U                          | NHH                         | 367                      | 4.037                     | 0.000                     | 0.000                     | 13                     | 34                   |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 750   | U                          | NHH                         | 57                       | 0.628                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Rubber Tired Loaders    | D              | 1000  | U                          | NHH                         | 8                        | 0.082                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Scrapers                | D              | 120   | U                          | NHH                         | 4                        | 0.041                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Scrapers                | D              | 175   | U                          | NHH                         | 55                       | 0.598                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Construction and Mining Equipment | Scrapers                | D              | 250   | U                          | NHH                         | 75                       | 0.825                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Construction and Mining Equipment | Scrapers                | D              | 500   | U                          | NHH                         | 318                      | 3.484                     | 0.000                     | 0.000                     | 7                      | 22                   |
| Construction and Mining Equipment | Scrapers                | D              | 750   | U                          | NHH                         | 98                       | 1.068                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Construction and Mining Equipment | Signal Boards           | G4             | 5     | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Signal Boards           | G4             | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Signal Boards           | D              | 15    | U                          | NHH                         | 12                       | 0.132                     | 0.000                     | 0.000                     | 21                     | 43                   |
| Construction and Mining Equipment | Signal Boards           | D              | 50    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Signal Boards           | D              | 120   | U                          | NHH                         | 9                        | 0.099                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Construction and Mining Equipment | Signal Boards           | D              | 175   | U                          | NHH                         | 11                       | 0.119                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Signal Boards           | D              | 250   | U                          | NHH                         | 4                        | 0.041                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Skid Steer Loaders      | G4             | 15    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |





| Class of Equipment                | Equipment                 | Engine         | MaxHP | Commercial or              | Handheld or<br>Non-handheld | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|---------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                           | Type<br>& Fuel |       | Residential<br>Application |                             | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Skid Steer Loaders        | G4             | 25    | U                          | NHH                         | 26                       | 0.122                     | 0.000                     | 0.000                     | 27                     | 23                   |
| Construction and Mining Equipment | Skid Steer Loaders        | G4             | 50    | U                          | NHH                         | 7                        | 0.059                     | 0.000                     | 0.000                     | 4                      | 4                    |
| Construction and Mining Equipment | Skid Steer Loaders        | G4             | 120   | U                          | NHH                         | 10                       | 0.088                     | 0.000                     | 0.000                     | 3                      | 2                    |
| Construction and Mining Equipment | Skid Steer Loaders        | D              | 25    | U                          | NHH                         | 20                       | 0.223                     | 0.000                     | 0.000                     | 14                     | 32                   |
| Construction and Mining Equipment | Skid Steer Loaders        | D              | 50    | U                          | NHH                         | 358                      | 3.845                     | 0.001                     | 0.000                     | 129                    | 302                  |
| Construction and Mining Equipment | Skid Steer Loaders        | D              | 120   | U                          | NHH                         | 309                      | 3.376                     | 0.001                     | 0.000                     | 67                     | 158                  |
| Construction and Mining Equipment | Surfacing Equipment       | G4             | 5     | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 10                     | 5                    |
| Construction and Mining Equipment | Surfacing Equipment       | G4             | 15    | U                          | NHH                         | 15                       | 0.074                     | 0.000                     | 0.000                     | 29                     | 40                   |
| Construction and Mining Equipment | Surfacing Equipment       | G4             | 25    | U                          | NHH                         | 1                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 50    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 120   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 175   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 250   | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 500   | U                          | NHH                         | 5                        | 0.051                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 750   | U                          | NHH                         | 5                        | 0.052                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Tampers/Rammers           | G2             | 15    | U                          | NHH                         | 2                        | 0.012                     | 0.000                     | 0.000                     | 22                     | 11                   |
| Construction and Mining Equipment | Tampers/Rammers           | G4             | 15    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | G4             | 120   | U                          | NHH                         | 4                        | 0.035                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 25    | U                          | NHH                         | 4                        | 0.043                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 50    | U                          | NHH                         | 47                       | 0.500                     | 0.000                     | 0.000                     | 12                     | 33                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 120   | U                          | NHH                         | 1,046                    | 11.391                    | 0.002                     | 0.000                     | 166                    | 441                  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 175   | U                          | NHH                         | 152                      | 1.666                     | 0.000                     | 0.000                     | 12                     | 33                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 250   | U                          | NHH                         | 83                       | 0.913                     | 0.000                     | 0.000                     | 4                      | 11                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 500   | U                          | NHH                         | 269                      | 2.958                     | 0.000                     | 0.000                     | 6                      | 17                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 750   | U                          | NHH                         | 301                      | 3.312                     | 0.000                     | 0.000                     | 5                      | 13                   |
| Construction and Mining Equipment | Trenchers                 | G4             | 15    | U                          | NHH                         | 6                        | 0.029                     | 0.000                     | 0.000                     | 8                      | 9                    |
| Construction and Mining Equipment | Trenchers                 | G4             | 25    | U                          | NHH                         | 10                       | 0.048                     | 0.000                     | 0.000                     | 6                      | 7                    |
| Construction and Mining Equipment | Trenchers                 | G4             | 50    | U                          | NHH                         | 7                        | 0.055                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Construction and Mining Equipment | Trenchers                 | G4             | 120   | U                          | NHH                         | 5                        | 0.040                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 15    | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 25    | U                          | NHH                         | 1                        | 0.016                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 50    | U                          | NHH                         | 60                       | 0.635                     | 0.000                     | 0.000                     | 22                     | 39                   |
| Construction and Mining Equipment | Trenchers                 | D              | 120   | U                          | NHH                         | 156                      | 1.697                     | 0.000                     | 0.000                     | 30                     | 52                   |
| Construction and Mining Equipment | Trenchers                 | D              | 175   | U                          | NHH                         | 38                       | 0.412                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Construction and Mining Equipment | Trenchers                 | D              | 250   | U                          | NHH                         | 5                        | 0.057                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 500   | U                          | NHH                         | 9                        | 0.102                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 750   | U                          | NHH                         | 2                        | 0.024                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 500   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 1000  | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Crane (Dredging)          | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Deck/door engine          | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 9999  | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment      | Equipment                  | Engine         | MaxHP | Commercial or              |                             | Fuel | Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-------------------------|----------------------------|----------------|-------|----------------------------|-----------------------------|------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                         |                            | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |      |                          |                           |                           |                           |                        |                      |
| Dredging                | Generator (Dredging)       | D              | 175   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Generator (Dredging)       | D              | 250   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Generator (Dredging)       | D              | 500   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Generator (Dredging)       | D              | 750   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Generator (Dredging)       | D              | 9999  | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Hoist/swing/winch          | D              | 50    | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Hoist/swing/winch          | D              | 120   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Hoist/swing/winch          | D              | 175   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Hoist/swing/winch          | D              | 250   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Hoist/swing/winch          | D              | 500   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Hoist/swing/winch          | D              | 750   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Hoist/swing/winch          | D              | 9999  | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Other (Dredging)           | D              | 120   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Other (Dredging)           | D              | 175   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Other (Dredging)           | D              | 250   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Other (Dredging)           | D              | 500   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Pump (Dredging)            | D              | 120   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Pump (Dredging)            | D              | 175   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Pump (Dredging)            | D              | 250   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Pump (Dredging)            | D              | 500   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Pump (Dredging)            | D              | 750   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                | Pump (Dredging)            | D              | 9999  | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Entertainment Equipment | Compressor (Entertainment) | D              | 120   | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Entertainment Equipment | Generator (Entertainment)  | D              | 50    | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Entertainment Equipment | Generator (Entertainment)  | D              | 120   | U                          | NHH                         |      | 2                        | 0.024                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Entertainment Equipment | Generator (Entertainment)  | D              | 175   | U                          | NHH                         |      | 3                        | 0.033                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Entertainment Equipment | Generator (Entertainment)  | D              | 250   | U                          | NHH                         |      | 6                        | 0.068                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Entertainment Equipment | Generator (Entertainment)  | D              | 500   | U                          | NHH                         |      | 13                       | 0.148                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Entertainment Equipment | Generator (Entertainment)  | D              | 750   | U                          | NHH                         |      | 5                        | 0.051                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Entertainment Equipment | Generator (Entertainment)  | D              | 9999  | U                          | NHH                         |      | 1                        | 0.013                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment    | Aerial Lifts               | G4             | 15    | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment    | Aerial Lifts               | G4             | 25    | U                          | NHH                         |      | 2                        | 0.009                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Industrial Equipment    | Aerial Lifts               | G4             | 50    | U                          | NHH                         |      | 4                        | 0.032                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Industrial Equipment    | Aerial Lifts               | G4             | 120   | U                          | NHH                         |      | 7                        | 0.065                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Industrial Equipment    | Aerial Lifts               | C4             | 15    | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment    | Aerial Lifts               | C4             | 25    | U                          | NHH                         |      | 3                        | 0.015                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Industrial Equipment    | Aerial Lifts               | D              | 15    | U                          | NHH                         |      | 1                        | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Industrial Equipment    | Aerial Lifts               | D              | 25    | U                          | NHH                         |      | 1                        | 0.011                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Industrial Equipment    | Aerial Lifts               | D              | 50    | U                          | NHH                         |      | 7                        | 0.072                     | 0.000                     | 0.000                     | 7                      | 7                    |
| Industrial Equipment    | Aerial Lifts               | D              | 120   | U                          | NHH                         |      | 11                       | 0.124                     | 0.000                     | 0.000                     | 6                      | 7                    |
| Industrial Equipment    | Aerial Lifts               | D              | 500   | U                          | NHH                         |      | 8                        | 0.089                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Industrial Equipment    | Aerial Lifts               | D              | 750   | U                          | NHH                         |      | 1                        | 0.013                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment    | Forklifts                  | G4             | 25    | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment    | Forklifts                  | G4             | 50    | U                          | NHH                         |      | 66                       | 0.434                     | 0.000                     | 0.000                     | 8                      | 41                   |
| Industrial Equipment    | Forklifts                  | G4             | 120   | U                          | NHH                         |      | 306                      | 2.573                     | 0.000                     | 0.001                     | 29                     | 144                  |
| Industrial Equipment    | Forklifts                  | G4             | 175   | U                          | NHH                         |      | 21                       | 0.191                     | 0.000                     | 0.000                     | 1                      | 5                    |
| Industrial Equipment    | Forklifts                  | C4             | 25    | U                          | NHH                         |      | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment    | Forklifts                  | C4             | 50    | U                          | NHH                         |      | 101                      | 0.686                     | 0.001                     | 0.000                     | 15                     | 75                   |
| Industrial Equipment    | Forklifts                  | C4             | 120   | U                          | NHH                         |      | 629                      | 4.111                     | 0.007                     | 0.000                     | 53                     | 263                  |
| Industrial Equipment    | Forklifts                  | C4             | 175   | U                          | NHH                         |      | 47                       | 0.314                     | 0.000                     | 0.000                     | 2                      | 10                   |
| Industrial Equipment    | Forklifts                  | D              | 50    | U                          | NHH                         |      | 7                        | 0.077                     | 0.000                     | 0.000                     | 2                      | 10                   |



| Class of Equipment        | Equipment                         | Engine         | MaxHP | Commercial or              | Handheld or<br>Non-handheld | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------|-----------------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                           |                                   | Type<br>& Fuel |       | Residential<br>Application |                             | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Industrial Equipment      | Forklifts                         | D              | 120   | U                          | NHH                         | 24                       | 0.257                     | 0.000                     | 0.000                     | 3                      | 16                   |
| Industrial Equipment      | Forklifts                         | D              | 175   | U                          | NHH                         | 42                       | 0.463                     | 0.000                     | 0.000                     | 3                      | 17                   |
| Industrial Equipment      | Forklifts                         | D              | 250   | U                          | NHH                         | 57                       | 0.632                     | 0.000                     | 0.000                     | 3                      | 16                   |
| Industrial Equipment      | Forklifts                         | D              | 500   | U                          | NHH                         | 35                       | 0.390                     | 0.000                     | 0.000                     | 1                      | 7                    |
| Industrial Equipment      | Other General Industrial Equipmen | G2             | 15    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other General Industrial Equipmen | G4             | 15    | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Industrial Equipment      | Other General Industrial Equipmen | G4             | 25    | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Industrial Equipment      | Other General Industrial Equipmen | G4             | 50    | U                          | NHH                         | 3                        | 0.022                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Industrial Equipment      | Other General Industrial Equipmen | G4             | 120   | U                          | NHH                         | 2                        | 0.019                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Industrial Equipment      | Other General Industrial Equipmen | G4             | 175   | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 15    | U                          | NHH                         | 0                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 25    | U                          | NHH                         | 1                        | 0.016                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 50    | U                          | NHH                         | 3                        | 0.029                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 120   | U                          | NHH                         | 30                       | 0.329                     | 0.000                     | 0.000                     | 3                      | 11                   |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 175   | U                          | NHH                         | 47                       | 0.511                     | 0.000                     | 0.000                     | 3                      | 11                   |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 250   | U                          | NHH                         | 65                       | 0.719                     | 0.000                     | 0.000                     | 3                      | 11                   |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 500   | U                          | NHH                         | 128                      | 1.404                     | 0.000                     | 0.000                     | 3                      | 11                   |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 750   | U                          | NHH                         | 53                       | 0.578                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Industrial Equipment      | Other General Industrial Equipmen | D              | 1000  | U                          | NHH                         | 41                       | 0.450                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Industrial Equipment      | Other Material Handling Equipment | G4             | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other Material Handling Equipment | G4             | 120   | U                          | NHH                         | 1                        | 0.013                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 50    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 120   | U                          | NHH                         | 1                        | 0.013                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 175   | U                          | NHH                         | 3                        | 0.028                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 250   | U                          | NHH                         | 7                        | 0.078                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 500   | U                          | NHH                         | 2                        | 0.019                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 9999  | U                          | NHH                         | 2                        | 0.022                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 15    | U                          | NHH                         | 1                        | 0.003                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 25    | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 50    | U                          | NHH                         | 9                        | 0.070                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 120   | U                          | NHH                         | 12                       | 0.113                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 175   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 25    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 50    | U                          | NHH                         | 15                       | 0.160                     | 0.000                     | 0.000                     | 3                      | 10                   |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 120   | U                          | NHH                         | 58                       | 0.631                     | 0.000                     | 0.000                     | 5                      | 17                   |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 175   | U                          | NHH                         | 49                       | 0.538                     | 0.000                     | 0.000                     | 2                      | 8                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 250   | U                          | NHH                         | 9                        | 0.100                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 2     | C                          | HH                          | 16                       | 0.064                     | 0.001                     | 0.000                     | 332                    | 263                  |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 2     | R                          | HH                          | 4                        | 0.012                     | 0.000                     | 0.000                     | 3,737                  | 50                   |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 15    | C                          | HH                          | 27                       | 0.109                     | 0.001                     | 0.000                     | 234                    | 185                  |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 15    | R                          | HH                          | 5                        | 0.021                     | 0.000                     | 0.000                     | 2,632                  | 35                   |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2             | 15    | C                          | HH                          | 33                       | 0.136                     | 0.002                     | 0.000                     | 291                    | 231                  |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2             | 15    | R                          | HH                          | 8                        | 0.026                     | 0.000                     | 0.000                     | 3,276                  | 44                   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 15    | C                          | NHH                         | 2                        | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 15    | R                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 25    | C                          | NHH                         | 15                       | 0.068                     | 0.000                     | 0.000                     | 3                      | 10                   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 25    | R                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 5                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 120   | U                          | NHH                         | 5                        | 0.056                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 175   | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment        | Equipment                     | Engine         | MaxHP | Commercial or              |                             | Fuel | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------|-------------------------------|----------------|-------|----------------------------|-----------------------------|------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                           |                               | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |      |                           |                           |                           |                        |                      |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D              | 250   | U                          | NHH                         | 0    | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D              | 500   | U                          | NHH                         | 2    | 0.027                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D              | 750   | U                          | NHH                         | 7    | 0.074                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders       | D              | 1000  | U                          | NHH                         | 18   | 0.201                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G2             | 15    | C                          | NHH                         | 4    | 0.020                     | 0.000                     | 0.000                     | 4                      | 9                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G2             | 25    | C                          | NHH                         | 4    | 0.021                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4             | 15    | C                          | NHH                         | 46   | 0.223                     | 0.000                     | 0.000                     | 39                     | 86                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4             | 25    | C                          | NHH                         | 41   | 0.189                     | 0.000                     | 0.000                     | 19                     | 42                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4             | 50    | U                          | NHH                         | 25   | 0.188                     | 0.000                     | 0.000                     | 8                      | 16                   |
| Lawn and Garden Equipment | Commercial Turf Equipment     | G4             | 120   | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | D              | 15    | U                          | NHH                         | 3    | 0.032                     | 0.000                     | 0.000                     | 2                      | 7                    |
| Lawn and Garden Equipment | Commercial Turf Equipment     | D              | 25    | U                          | NHH                         | 82   | 0.901                     | 0.000                     | 0.000                     | 43                     | 125                  |
| Lawn and Garden Equipment | Front Mowers                  | G4             | 15    | C                          | NHH                         | 11   | 0.053                     | 0.000                     | 0.000                     | 28                     | 20                   |
| Lawn and Garden Equipment | Front Mowers                  | G4             | 15    | R                          | NHH                         | 38   | 0.178                     | 0.000                     | 0.000                     | 891                    | 69                   |
| Lawn and Garden Equipment | Front Mowers                  | G4             | 25    | C                          | NHH                         | 12   | 0.054                     | 0.000                     | 0.000                     | 22                     | 16                   |
| Lawn and Garden Equipment | Front Mowers                  | G4             | 25    | R                          | NHH                         | 40   | 0.182                     | 0.000                     | 0.000                     | 698                    | 54                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4             | 15    | C                          | NHH                         | 25   | 0.121                     | 0.000                     | 0.000                     | 110                    | 39                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4             | 15    | R                          | NHH                         | 19   | 0.089                     | 0.000                     | 0.000                     | 716                    | 29                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4             | 25    | C                          | NHH                         | 16   | 0.074                     | 0.000                     | 0.000                     | 43                     | 15                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4             | 25    | R                          | NHH                         | 12   | 0.055                     | 0.000                     | 0.000                     | 282                    | 11                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | G4             | 50    | U                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | D              | 15    | U                          | NHH                         | 57   | 0.622                     | 0.000                     | 0.000                     | 90                     | 134                  |
| Lawn and Garden Equipment | Lawn & Garden Tractors        | D              | 25    | U                          | NHH                         | 68   | 0.749                     | 0.000                     | 0.000                     | 70                     | 105                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G2             | 15    | C                          | NHH                         | 13   | 0.079                     | 0.000                     | 0.000                     | 185                    | 116                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G2             | 15    | R                          | NHH                         | 10   | 0.040                     | 0.000                     | 0.000                     | 1,393                  | 59                   |
| Lawn and Garden Equipment | Lawn Mowers                   | G4             | 5     | C                          | NHH                         | 83   | 0.469                     | 0.001                     | 0.001                     | 1,098                  | 688                  |
| Lawn and Garden Equipment | Lawn Mowers                   | G4             | 5     | R                          | NHH                         | 116  | 0.504                     | 0.001                     | 0.001                     | 17,410                 | 739                  |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G2             | 2     | C                          | HH                          | 46   | 0.206                     | 0.002                     | 0.000                     | 1,617                  | 870                  |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G2             | 2     | R                          | HH                          | 4    | 0.013                     | 0.000                     | 0.000                     | 4,170                  | 55                   |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G4             | 5     | C                          | NHH                         | 1    | 0.003                     | 0.000                     | 0.000                     | 51                     | 9                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | G4             | 5     | R                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 44                     | 1                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D              | 15    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Leaf Blowers/Vacuums          | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2             | 2     | C                          | HH                          | 0    | 0.000                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2             | 2     | R                          | HH                          | 0    | 0.000                     | 0.000                     | 0.000                     | 56                     | 1                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2             | 15    | C                          | HH                          | 0    | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G2             | 15    | R                          | HH                          | 0    | 0.000                     | 0.000                     | 0.000                     | 24                     | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 5     | C                          | NHH                         | 1    | 0.007                     | 0.000                     | 0.000                     | 34                     | 6                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 5     | R                          | NHH                         | 3    | 0.014                     | 0.000                     | 0.000                     | 1,050                  | 12                   |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 15    | C                          | NHH                         | 1    | 0.006                     | 0.000                     | 0.000                     | 15                     | 3                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 15    | R                          | NHH                         | 3    | 0.012                     | 0.000                     | 0.000                     | 467                    | 5                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 25    | C                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 25    | R                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 10                     | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | G4             | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | D              | 15    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Other Lawn & Garden Equipment | D              | 25    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Rear Engine Riding Mowers     | G4             | 15    | C                          | NHH                         | 149  | 0.724                     | 0.000                     | 0.001                     | 601                    | 447                  |
| Lawn and Garden Equipment | Rear Engine Riding Mowers     | G4             | 15    | R                          | NHH                         | 14   | 0.066                     | 0.000                     | 0.000                     | 527                    | 41                   |
| Lawn and Garden Equipment | Rear Engine Riding Mowers     | G4             | 25    | C                          | NHH                         | 1    | 0.006                     | 0.000                     | 0.000                     | 3                      | 2                    |



| Class of Equipment         | Equipment                     | Engine         | MaxHP | Commercial or              |                             | Fuel | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------|-------------------------------|----------------|-------|----------------------------|-----------------------------|------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                            |                               | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |      |                           |                           |                           |                        |                      |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4             | 25    | R                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Lawn and Garden Equipment  | Shredders                     | G2             | 15    | C                          | NHH                         | 1    | 0.007                     | 0.000                     | 0.000                     | 8                      | 3                    |
| Lawn and Garden Equipment  | Shredders                     | G2             | 15    | R                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 291                    | 1                    |
| Lawn and Garden Equipment  | Shredders                     | G4             | 5     | C                          | NHH                         | 2    | 0.012                     | 0.000                     | 0.000                     | 22                     | 8                    |
| Lawn and Garden Equipment  | Shredders                     | G4             | 5     | R                          | NHH                         | 1    | 0.003                     | 0.000                     | 0.000                     | 805                    | 2                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2             | 15    | C                          | HH                          | 0    | 0.002                     | 0.000                     | 0.000                     | 13                     | 2                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2             | 15    | R                          | HH                          | 0    | 0.001                     | 0.000                     | 0.000                     | 116                    | 1                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2             | 25    | C                          | HH                          | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G2             | 25    | R                          | HH                          | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4             | 5     | C                          | NHH                         | 2    | 0.011                     | 0.000                     | 0.000                     | 140                    | 17                   |
| Lawn and Garden Equipment  | Snowblowers                   | G4             | 5     | R                          | NHH                         | 1    | 0.004                     | 0.000                     | 0.000                     | 1,257                  | 6                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4             | 15    | C                          | NHH                         | 4    | 0.019                     | 0.000                     | 0.000                     | 106                    | 13                   |
| Lawn and Garden Equipment  | Snowblowers                   | G4             | 15    | R                          | NHH                         | 2    | 0.007                     | 0.000                     | 0.000                     | 951                    | 5                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4             | 25    | C                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | G4             | 25    | R                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 3                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | D              | 175   | U                          | NHH                         | 0    | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment  | Snowblowers                   | D              | 250   | U                          | NHH                         | 6    | 0.067                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Lawn and Garden Equipment  | Snowblowers                   | D              | 500   | U                          | NHH                         | 27   | 0.299                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Lawn and Garden Equipment  | Tillers                       | G4             | 5     | C                          | NHH                         | 3    | 0.013                     | 0.000                     | 0.000                     | 114                    | 17                   |
| Lawn and Garden Equipment  | Tillers                       | G4             | 5     | R                          | NHH                         | 4    | 0.017                     | 0.000                     | 0.000                     | 443                    | 22                   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2             | 2     | C                          | HH                          | 16   | 0.077                     | 0.001                     | 0.000                     | 1,083                  | 360                  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2             | 2     | R                          | HH                          | 31   | 0.151                     | 0.001                     | 0.000                     | 12,072                 | 711                  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4             | 5     | C                          | NHH                         | 2    | 0.013                     | 0.000                     | 0.000                     | 200                    | 75                   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4             | 5     | R                          | NHH                         | 2    | 0.009                     | 0.000                     | 0.000                     | 934                    | 55                   |
| Lawn and Garden Equipment  | Wood Splitters                | G4             | 5     | C                          | NHH                         | 4    | 0.021                     | 0.000                     | 0.000                     | 37                     | 13                   |
| Lawn and Garden Equipment  | Wood Splitters                | G4             | 5     | R                          | NHH                         | 1    | 0.005                     | 0.000                     | 0.000                     | 926                    | 3                    |
| Light Commercial Equipment | Air Compressors               | G4             | 5     | C                          | NHH                         | 8    | 0.047                     | 0.000                     | 0.000                     | 23                     | 36                   |
| Light Commercial Equipment | Air Compressors               | G4             | 5     | R                          | NHH                         | 4    | 0.025                     | 0.000                     | 0.000                     | 18                     | 19                   |
| Light Commercial Equipment | Air Compressors               | G4             | 15    | C                          | NHH                         | 7    | 0.034                     | 0.000                     | 0.000                     | 12                     | 18                   |
| Light Commercial Equipment | Air Compressors               | G4             | 15    | R                          | NHH                         | 4    | 0.018                     | 0.000                     | 0.000                     | 9                      | 10                   |
| Light Commercial Equipment | Air Compressors               | G4             | 25    | C                          | NHH                         | 2    | 0.011                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Light Commercial Equipment | Air Compressors               | G4             | 25    | R                          | NHH                         | 1    | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Air Compressors               | G4             | 50    | U                          | NHH                         | 8    | 0.060                     | 0.000                     | 0.000                     | 3                      | 4                    |
| Light Commercial Equipment | Air Compressors               | G4             | 120   | U                          | NHH                         | 45   | 0.386                     | 0.000                     | 0.000                     | 9                      | 12                   |
| Light Commercial Equipment | Air Compressors               | G4             | 175   | U                          | NHH                         | 5    | 0.048                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Air Compressors               | D              | 15    | U                          | NHH                         | 0    | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Air Compressors               | D              | 25    | U                          | NHH                         | 1    | 0.011                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Light Commercial Equipment | Air Compressors               | D              | 50    | U                          | NHH                         | 14   | 0.152                     | 0.000                     | 0.000                     | 6                      | 14                   |
| Light Commercial Equipment | Air Compressors               | D              | 120   | U                          | NHH                         | 196  | 2.132                     | 0.000                     | 0.000                     | 41                     | 91                   |
| Light Commercial Equipment | Air Compressors               | D              | 175   | U                          | NHH                         | 14   | 0.152                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Light Commercial Equipment | Air Compressors               | D              | 250   | U                          | NHH                         | 29   | 0.317                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Light Commercial Equipment | Air Compressors               | D              | 500   | U                          | NHH                         | 66   | 0.731                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Light Commercial Equipment | Air Compressors               | D              | 750   | U                          | NHH                         | 38   | 0.423                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Light Commercial Equipment | Air Compressors               | D              | 1000  | U                          | NHH                         | 1    | 0.014                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Gas Compressors               | C4             | 50    | U                          | NHH                         | 16   | 0.108                     | 0.000                     | 0.000                     | 0                      | 5                    |
| Light Commercial Equipment | Gas Compressors               | C4             | 120   | U                          | NHH                         | 92   | 0.607                     | 0.000                     | 0.000                     | 0                      | 10                   |
| Light Commercial Equipment | Gas Compressors               | C4             | 175   | U                          | NHH                         | 24   | 0.158                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Light Commercial Equipment | Gas Compressors               | C4             | 250   | U                          | NHH                         | 24   | 0.163                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Gas Compressors               | C4             | 500   | U                          | NHH                         | 34   | 0.229                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Generator Sets                | G2             | 2     | C                          | NHH                         | 0    | 0.002                     | 0.000                     | 0.000                     | 14                     | 5                    |
| Light Commercial Equipment | Generator Sets                | G2             | 2     | R                          | NHH                         | 0    | 0.001                     | 0.000                     | 0.000                     | 11                     | 3                    |





| Class of Equipment         | Equipment        | Engine         | MaxHP | Commercial or              |                             | Fuel                     |       | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------|------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|-------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                            |                  | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |       |                           |                           |                           |                        |                      |
| Light Commercial Equipment | Generator Sets   | G2             | 15    | C                          | NHH                         | 0                        | 0.000 | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment | Generator Sets   | G2             | 15    | R                          | NHH                         | 0                        | 0.000 | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 5     | C                          | NHH                         | 19                       | 0.085 | 0.000                     | 0.000                     | 180                       | 66                     |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 5     | R                          | NHH                         | 11                       | 0.045 | 0.000                     | 0.000                     | 141                       | 35                     |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 15    | C                          | NHH                         | 118                      | 0.526 | 0.001                     | 0.000                     | 494                       | 182                    |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 15    | R                          | NHH                         | 65                       | 0.278 | 0.000                     | 0.000                     | 388                       | 96                     |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 25    | C                          | NHH                         | 135                      | 0.597 | 0.001                     | 0.000                     | 265                       | 98                     |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 25    | R                          | NHH                         | 73                       | 0.316 | 0.000                     | 0.000                     | 209                       | 52                     |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 50    | U                          | NHH                         | 64                       | 0.522 | 0.000                     | 0.000                     | 88                        | 28                     |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 120   | U                          | NHH                         | 29                       | 0.259 | 0.000                     | 0.000                     | 17                        | 5                      |                      |
| Light Commercial Equipment | Generator Sets   | G4             | 175   | U                          | NHH                         | 5                        | 0.042 | 0.000                     | 0.000                     | 2                         | 1                      |                      |
| Light Commercial Equipment | Generator Sets   | C4             | 120   | U                          | NHH                         | 3                        | 0.017 | 0.000                     | 0.000                     | 1                         | 0                      |                      |
| Light Commercial Equipment | Generator Sets   | C4             | 175   | U                          | NHH                         | 4                        | 0.024 | 0.000                     | 0.000                     | 1                         | 0                      |                      |
| Light Commercial Equipment | Generator Sets   | D              | 15    | U                          | NHH                         | 14                       | 0.157 | 0.000                     | 0.000                     | 33                        | 31                     |                      |
| Light Commercial Equipment | Generator Sets   | D              | 25    | U                          | NHH                         | 18                       | 0.198 | 0.000                     | 0.000                     | 24                        | 22                     |                      |
| Light Commercial Equipment | Generator Sets   | D              | 50    | U                          | NHH                         | 39                       | 0.420 | 0.000                     | 0.000                     | 30                        | 27                     |                      |
| Light Commercial Equipment | Generator Sets   | D              | 120   | U                          | NHH                         | 149                      | 1.625 | 0.000                     | 0.000                     | 45                        | 42                     |                      |
| Light Commercial Equipment | Generator Sets   | D              | 175   | U                          | NHH                         | 16                       | 0.175 | 0.000                     | 0.000                     | 3                         | 2                      |                      |
| Light Commercial Equipment | Generator Sets   | D              | 250   | U                          | NHH                         | 13                       | 0.146 | 0.000                     | 0.000                     | 1                         | 1                      |                      |
| Light Commercial Equipment | Generator Sets   | D              | 500   | U                          | NHH                         | 47                       | 0.516 | 0.000                     | 0.000                     | 3                         | 3                      |                      |
| Light Commercial Equipment | Generator Sets   | D              | 750   | U                          | NHH                         | 47                       | 0.517 | 0.000                     | 0.000                     | 2                         | 2                      |                      |
| Light Commercial Equipment | Generator Sets   | D              | 9999  | U                          | NHH                         | 24                       | 0.260 | 0.000                     | 0.000                     | 1                         | 0                      |                      |
| Light Commercial Equipment | Pressure Washers | G4             | 5     | C                          | NHH                         | 7                        | 0.036 | 0.000                     | 0.000                     | 48                        | 18                     |                      |
| Light Commercial Equipment | Pressure Washers | G4             | 5     | R                          | NHH                         | 4                        | 0.019 | 0.000                     | 0.000                     | 38                        | 9                      |                      |
| Light Commercial Equipment | Pressure Washers | G4             | 15    | C                          | NHH                         | 10                       | 0.045 | 0.000                     | 0.000                     | 43                        | 16                     |                      |
| Light Commercial Equipment | Pressure Washers | G4             | 15    | R                          | NHH                         | 6                        | 0.024 | 0.000                     | 0.000                     | 34                        | 8                      |                      |
| Light Commercial Equipment | Pressure Washers | G4             | 25    | C                          | NHH                         | 5                        | 0.022 | 0.000                     | 0.000                     | 8                         | 3                      |                      |
| Light Commercial Equipment | Pressure Washers | G4             | 25    | R                          | NHH                         | 3                        | 0.011 | 0.000                     | 0.000                     | 6                         | 2                      |                      |
| Light Commercial Equipment | Pressure Washers | G4             | 50    | U                          | NHH                         | 1                        | 0.005 | 0.000                     | 0.000                     | 1                         | 0                      |                      |
| Light Commercial Equipment | Pressure Washers | D              | 15    | U                          | NHH                         | 0                        | 0.001 | 0.000                     | 0.000                     | 2                         | 1                      |                      |
| Light Commercial Equipment | Pressure Washers | D              | 25    | U                          | NHH                         | 0                        | 0.001 | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment | Pressure Washers | D              | 50    | U                          | NHH                         | 0                        | 0.002 | 0.000                     | 0.000                     | 1                         | 0                      |                      |
| Light Commercial Equipment | Pressure Washers | D              | 120   | U                          | NHH                         | 0                        | 0.001 | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment | Pumps            | G2             | 2     | C                          | NHH                         | 2                        | 0.013 | 0.000                     | 0.000                     | 54                        | 38                     |                      |
| Light Commercial Equipment | Pumps            | G2             | 2     | R                          | NHH                         | 1                        | 0.007 | 0.000                     | 0.000                     | 43                        | 20                     |                      |
| Light Commercial Equipment | Pumps            | G2             | 15    | C                          | NHH                         | 5                        | 0.027 | 0.000                     | 0.000                     | 15                        | 10                     |                      |
| Light Commercial Equipment | Pumps            | G2             | 15    | R                          | NHH                         | 3                        | 0.014 | 0.000                     | 0.000                     | 12                        | 5                      |                      |
| Light Commercial Equipment | Pumps            | G2             | 25    | C                          | NHH                         | 0                        | 0.001 | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment | Pumps            | G2             | 25    | R                          | NHH                         | 0                        | 0.000 | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment | Pumps            | G4             | 5     | C                          | NHH                         | 9                        | 0.044 | 0.000                     | 0.000                     | 64                        | 45                     |                      |
| Light Commercial Equipment | Pumps            | G4             | 5     | R                          | NHH                         | 6                        | 0.023 | 0.000                     | 0.000                     | 50                        | 24                     |                      |
| Light Commercial Equipment | Pumps            | G4             | 15    | C                          | NHH                         | 28                       | 0.128 | 0.000                     | 0.000                     | 69                        | 49                     |                      |
| Light Commercial Equipment | Pumps            | G4             | 15    | R                          | NHH                         | 15                       | 0.067 | 0.000                     | 0.000                     | 54                        | 26                     |                      |
| Light Commercial Equipment | Pumps            | G4             | 25    | C                          | NHH                         | 15                       | 0.069 | 0.000                     | 0.000                     | 18                        | 13                     |                      |
| Light Commercial Equipment | Pumps            | G4             | 25    | R                          | NHH                         | 8                        | 0.037 | 0.000                     | 0.000                     | 14                        | 7                      |                      |
| Light Commercial Equipment | Pumps            | G4             | 50    | U                          | NHH                         | 10                       | 0.079 | 0.000                     | 0.000                     | 7                         | 4                      |                      |
| Light Commercial Equipment | Pumps            | G4             | 120   | U                          | NHH                         | 34                       | 0.297 | 0.000                     | 0.000                     | 9                         | 5                      |                      |
| Light Commercial Equipment | Pumps            | G4             | 175   | U                          | NHH                         | 1                        | 0.013 | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment | Pumps            | D              | 15    | U                          | NHH                         | 9                        | 0.102 | 0.000                     | 0.000                     | 25                        | 28                     |                      |
| Light Commercial Equipment | Pumps            | D              | 25    | U                          | NHH                         | 7                        | 0.080 | 0.000                     | 0.000                     | 7                         | 8                      |                      |
| Light Commercial Equipment | Pumps            | D              | 50    | U                          | NHH                         | 23                       | 0.246 | 0.000                     | 0.000                     | 13                        | 14                     |                      |



| Class of Equipment              | Equipment             | Engine         | MaxHP | Commercial or              |                             | Fuel                     |        | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------------|-----------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|--------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                 |                       | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |        |                           |                           |                           |                        |                      |
| Light Commercial Equipment      | Pumps                 | D              | 120   | U                          | NHH                         | 100                      | 1.095  | 0.000                     | 0.000                     | 25                        | 28                     |                      |
| Light Commercial Equipment      | Pumps                 | D              | 175   | U                          | NHH                         | 19                       | 0.213  | 0.000                     | 0.000                     | 3                         | 3                      |                      |
| Light Commercial Equipment      | Pumps                 | D              | 250   | U                          | NHH                         | 20                       | 0.220  | 0.000                     | 0.000                     | 2                         | 2                      |                      |
| Light Commercial Equipment      | Pumps                 | D              | 500   | U                          | NHH                         | 1                        | 0.007  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment      | Pumps                 | D              | 750   | U                          | NHH                         | 0                        | 0.002  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment      | Pumps                 | D              | 9999  | U                          | NHH                         | 10                       | 0.107  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment      | Welders               | G4             | 15    | C                          | NHH                         | 16                       | 0.068  | 0.000                     | 0.000                     | 45                        | 26                     |                      |
| Light Commercial Equipment      | Welders               | G4             | 25    | C                          | NHH                         | 86                       | 0.381  | 0.000                     | 0.000                     | 163                       | 93                     |                      |
| Light Commercial Equipment      | Welders               | G4             | 50    | U                          | NHH                         | 20                       | 0.158  | 0.000                     | 0.000                     | 14                        | 8                      |                      |
| Light Commercial Equipment      | Welders               | G4             | 120   | U                          | NHH                         | 28                       | 0.248  | 0.000                     | 0.000                     | 14                        | 8                      |                      |
| Light Commercial Equipment      | Welders               | G4             | 175   | U                          | NHH                         | 3                        | 0.031  | 0.000                     | 0.000                     | 1                         | 1                      |                      |
| Light Commercial Equipment      | Welders               | D              | 15    | U                          | NHH                         | 6                        | 0.062  | 0.000                     | 0.000                     | 11                        | 20                     |                      |
| Light Commercial Equipment      | Welders               | D              | 25    | U                          | NHH                         | 9                        | 0.099  | 0.000                     | 0.000                     | 10                        | 17                     |                      |
| Light Commercial Equipment      | Welders               | D              | 50    | U                          | NHH                         | 65                       | 0.698  | 0.000                     | 0.000                     | 31                        | 54                     |                      |
| Light Commercial Equipment      | Welders               | D              | 120   | U                          | NHH                         | 76                       | 0.825  | 0.000                     | 0.000                     | 24                        | 42                     |                      |
| Light Commercial Equipment      | Welders               | D              | 175   | U                          | NHH                         | 1                        | 0.010  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment      | Welders               | D              | 250   | U                          | NHH                         | 0                        | 0.003  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Light Commercial Equipment      | Welders               | D              | 500   | U                          | NHH                         | 1                        | 0.010  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Logging Equipment               | Chainsaws             | G2             | 15    | U                          | HH                          | 358                      | 1.515  | 0.017                     | 0.001                     | 770                       | 435                    |                      |
| Logging Equipment               | Fellers/Bunchers      | D              | 120   | U                          | NHH                         | 1,438                    | 15.666 | 0.003                     | 0.000                     | 98                        | 342                    |                      |
| Logging Equipment               | Fellers/Bunchers      | D              | 175   | U                          | NHH                         | 2,612                    | 28.595 | 0.003                     | 0.000                     | 121                       | 423                    |                      |
| Logging Equipment               | Fellers/Bunchers      | D              | 250   | U                          | NHH                         | 2,278                    | 25.137 | 0.002                     | 0.000                     | 74                        | 258                    |                      |
| Logging Equipment               | Fellers/Bunchers      | D              | 500   | U                          | NHH                         | 1,005                    | 11.092 | 0.001                     | 0.000                     | 22                        | 76                     |                      |
| Logging Equipment               | Fellers/Bunchers      | D              | 750   | U                          | NHH                         | 152                      | 1.681  | 0.000                     | 0.000                     | 2                         | 6                      |                      |
| Logging Equipment               | Shredders             | G4             | 15    | U                          | NHH                         | 505                      | 2.429  | 0.002                     | 0.002                     | 1,208                     | 802                    |                      |
| Logging Equipment               | Shredders             | D              | 175   | U                          | NHH                         | 0                        | 0.002  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Logging Equipment               | Skidders              | D              | 120   | U                          | NHH                         | 772                      | 8.410  | 0.002                     | 0.000                     | 45                        | 178                    |                      |
| Logging Equipment               | Skidders              | D              | 175   | U                          | NHH                         | 1,819                    | 19.911 | 0.002                     | 0.000                     | 72                        | 284                    |                      |
| Logging Equipment               | Skidders              | D              | 250   | U                          | NHH                         | 998                      | 11.009 | 0.001                     | 0.000                     | 26                        | 105                    |                      |
| Logging Equipment               | Skidders              | D              | 500   | U                          | NHH                         | 67                       | 0.737  | 0.000                     | 0.000                     | 1                         | 6                      |                      |
| Military Tactical Support Equip | A/C unit              | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | A/C unit              | D              | 250   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | A/C unit              | D              | 500   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Aircraft Support      | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Aircraft Support      | D              | 175   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Cart                  | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Cart                  | D              | 175   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Cart                  | D              | 250   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Communications        | D              | 50    | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Communications        | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Compressor (Military) | D              | 50    | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Compressor (Military) | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Compressor (Military) | D              | 175   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Compressor (Military) | D              | 250   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Compressor (Military) | D              | 500   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Crane                 | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Crane                 | D              | 175   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Crane                 | D              | 250   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Deicer                | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Generator (Military)  | D              | 50    | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |
| Military Tactical Support Equip | Generator (Military)  | D              | 120   | U                          | NHH                         | 0                        | 0.000  | 0.000                     | 0.000                     | 0                         | 0                      |                      |



| Class of Equipment              | Equipment                        | Engine         | MaxHP | Commercial or              |                             | Fuel | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------------|----------------------------------|----------------|-------|----------------------------|-----------------------------|------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                 |                                  | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |      |                           |                           |                           |                        |                      |
| Military Tactical Support Equip | Generator (Military)             | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Generator (Military)             | D              | 750   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Hydraulic unit                   | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Lift (Military)                  | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Light                            | D              | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D              | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Other tactical support equipment | D              | 750   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Pressure Washers                 | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Pump (Military)                  | D              | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Pump (Military)                  | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Start Cart                       | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Start Cart                       | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Test Stand                       | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Welder                           | D              | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Military Tactical Support Equip | Welder                           | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D              | 25    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D              | 750   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Compressors (Workover)           | D              | 1000  | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig                        | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig                        | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig                        | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig                        | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig                        | D              | 750   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig                        | D              | 1000  | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig (Mobile)               | D              | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig (Mobile)               | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig (Mobile)               | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig (Mobile)               | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig (Mobile)               | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig (Mobile)               | D              | 750   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Drill Rig (Mobile)               | D              | 1000  | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Generator (Drilling)             | D              | 50    | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Generator (Drilling)             | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Generator (Drilling)             | D              | 175   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Generator (Drilling)             | D              | 250   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Generator (Drilling)             | D              | 500   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Generator (Drilling)             | D              | 750   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling                    | Generator (Workover)             | D              | 120   | U                          | NHH                         | 0    | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |





| Class of Equipment       | Equipment                         | Engine         | MaxHP | Commercial or              |                             | Fuel  | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|--------------------------|-----------------------------------|----------------|-------|----------------------------|-----------------------------|-------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                          |                                   | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld |       |                           |                           |                           |                        |                      |
| Oil Drilling             | Generator (Workover)              | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Generator (Workover)              | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Generator (Workover)              | D              | 500   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Generator (Workover)              | D              | 750   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Generator (Workover)              | D              | 9999  | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Lift (Drilling)                   | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Lift (Drilling)                   | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Lift (Drilling)                   | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Lift (Drilling)                   | D              | 500   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Lift (Drilling)                   | D              | 750   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Other Workover Equipment          | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Other Workover Equipment          | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Other Workover Equipment          | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Other Workover Equipment          | D              | 750   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Other Workover Equipment          | D              | 1000  | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pressure Washers                  | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Drilling)                   | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Drilling)                   | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Drilling)                   | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Drilling)                   | D              | 500   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Drilling)                   | D              | 750   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Drilling)                   | D              | 9999  | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Workover)                   | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Workover)                   | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Workover)                   | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Workover)                   | D              | 500   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Pump (Workover)                   | D              | 9999  | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Snubbing                          | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Swivel                            | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Swivel                            | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Swivel                            | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Swivel                            | D              | 500   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Workover Rig (Mobile)             | D              | 50    | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Workover Rig (Mobile)             | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Workover Rig (Mobile)             | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Workover Rig (Mobile)             | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Workover Rig (Mobile)             | D              | 500   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Workover Rig (Mobile)             | D              | 750   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Oil Drilling             | Workover Rig (Mobile)             | D              | 1000  | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment           | D              | 120   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment           | D              | 175   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment           | D              | 250   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment           | D              | 500   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment           | D              | 750   | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment           | D              | 1000  | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Pleasure Craft           | Personal Water Craft              | G2             | 9999  | U                          | NHH                         | 2,115 | 15.165                    | 0.050                     | 0.004                     | 8,341                  | 529                  |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine | G4             | 15    | U                          | NHH                         | 2     | 0.011                     | 0.000                     | 0.000                     | 141                    | 4                    |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine | D              | 50    | U                          | NHH                         | 0     | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin | G2             | 15    | U                          | NHH                         | 1     | 0.003                     | 0.000                     | 0.000                     | 92                     | 3                    |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin | G2             | 25    | U                          | NHH                         | 1     | 0.003                     | 0.000                     | 0.000                     | 50                     | 1                    |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin | G2             | 50    | U                          | NHH                         | 2     | 0.011                     | 0.000                     | 0.000                     | 46                     | 1                    |



| Class of Equipment     | Equipment                            | Engine      | MaxHP | Commercial or           |                          | Fuel                  |                        |                        |                        | Number of Equipment | Activity (hr/day) |
|------------------------|--------------------------------------|-------------|-------|-------------------------|--------------------------|-----------------------|------------------------|------------------------|------------------------|---------------------|-------------------|
|                        |                                      | Type & Fuel |       | Residential Application | Handheld or Non-handheld | Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) |                     |                   |
| Pleasure Craft         | Vessels w/Inboard Engines            | G4          | 250   | U                       | NHH                      | 4,849                 | 36.209                 | 0.013                  | 0.008                  | 3,364               | 855               |
| Pleasure Craft         | Vessels w/Inboard Engines            | D           | 250   | U                       | NHH                      | 2                     | 0.017                  | 0.000                  | 0.000                  | 1                   | 0                 |
| Pleasure Craft         | Vessels w/Inboard Jet Engines        | G4          | 500   | U                       | NHH                      | 1,448                 | 10.770                 | 0.004                  | 0.002                  | 1,073               | 214               |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 2     | U                       | NHH                      | 2                     | 0.006                  | 0.000                  | 0.000                  | 141                 | 18                |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 15    | U                       | NHH                      | 238                   | 0.931                  | 0.014                  | 0.001                  | 7,807               | 1,024             |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 25    | U                       | NHH                      | 182                   | 0.843                  | 0.008                  | 0.001                  | 2,121               | 278               |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 50    | U                       | NHH                      | 427                   | 2.777                  | 0.013                  | 0.001                  | 2,071               | 272               |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 120   | U                       | NHH                      | 785                   | 5.155                  | 0.022                  | 0.001                  | 1,821               | 239               |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 175   | U                       | NHH                      | 664                   | 4.250                  | 0.019                  | 0.001                  | 841                 | 110               |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 250   | U                       | NHH                      | 245                   | 1.603                  | 0.007                  | 0.000                  | 241                 | 32                |
| Pleasure Craft         | Vessels w/Outboard Engines           | G2          | 500   | U                       | NHH                      | 71                    | 0.452                  | 0.002                  | 0.000                  | 49                  | 6                 |
| Pleasure Craft         | Vessels w/Outboard Engines           | G4          | 50    | U                       | NHH                      | 128                   | 0.889                  | 0.000                  | 0.000                  | 729                 | 96                |
| Pleasure Craft         | Vessels w/Sterndrive Engines         | G4          | 250   | U                       | NHH                      | 7,210                 | 53.726                 | 0.019                  | 0.014                  | 8,592               | 1,714             |
| Railyard Operations    | Compressor (Railyard)                | D           | 120   | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Railyard Operations    | Crane (Rail-CHE)                     | D           | 120   | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Railyard Operations    | Crane (Rail-CHE)                     | D           | 175   | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Railyard Operations    | Generator (Railyard)                 | D           | 175   | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Railyard Operations    | Generator (Railyard)                 | D           | 9999  | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Railyard Operations    | Materials Handling (Rail-CHE)        | D           | 120   | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Recreational Equipment | All Terrain Vehicles (ATVs) Active   | G2          | 15    | U                       | NHH                      | 37                    | 0.124                  | 0.002                  | 0.000                  | 264                 | 976               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Active   | G2          | 25    | U                       | NHH                      | 24                    | 0.080                  | 0.002                  | 0.000                  | 172                 | 635               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Active   | G2          | 50    | U                       | NHH                      | 32                    | 0.106                  | 0.002                  | 0.000                  | 226                 | 836               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Active   | G4          | 15    | U                       | NHH                      | 15                    | 0.101                  | 0.000                  | 0.000                  | 215                 | 796               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Active   | G4          | 25    | U                       | NHH                      | 210                   | 1.403                  | 0.001                  | 0.004                  | 2,992               | 11,077            |
| Recreational Equipment | All Terrain Vehicles (ATVs) Active   | G4          | 50    | U                       | NHH                      | 9                     | 0.063                  | 0.000                  | 0.000                  | 135                 | 500               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Inactive | G2          | 15    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 80                  | 296               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Inactive | G2          | 25    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 52                  | 193               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Inactive | G2          | 50    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 69                  | 254               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Inactive | G4          | 15    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 65                  | 242               |
| Recreational Equipment | All Terrain Vehicles (ATVs) Inactive | G4          | 25    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 908                 | 3,363             |
| Recreational Equipment | All Terrain Vehicles (ATVs) Inactive | G4          | 50    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 41                  | 152               |
| Recreational Equipment | Golf Carts                           | G2          | 15    | U                       | NHH                      | 386                   | 1.963                  | 0.002                  | 0.002                  | 331                 | 1,001             |
| Recreational Equipment | Golf Carts                           | G4          | 15    | U                       | NHH                      | 328                   | 1.536                  | 0.002                  | 0.002                  | 259                 | 784               |
| Recreational Equipment | Minibikes                            | G4          | 5     | U                       | NHH                      | 10                    | 0.006                  | 0.000                  | 0.000                  | 115                 | 44                |
| Recreational Equipment | Off-Road Motorcycles Active          | G2          | 15    | U                       | NHH                      | 26                    | 0.086                  | 0.002                  | 0.000                  | 182                 | 675               |
| Recreational Equipment | Off-Road Motorcycles Active          | G2          | 25    | U                       | NHH                      | 22                    | 0.074                  | 0.001                  | 0.000                  | 157                 | 581               |
| Recreational Equipment | Off-Road Motorcycles Active          | G2          | 50    | U                       | NHH                      | 179                   | 0.599                  | 0.011                  | 0.000                  | 1,278               | 4,730             |
| Recreational Equipment | Off-Road Motorcycles Active          | G2          | 120   | U                       | NHH                      | 86                    | 0.287                  | 0.005                  | 0.000                  | 611                 | 2,263             |
| Recreational Equipment | Off-Road Motorcycles Active          | G4          | 15    | U                       | NHH                      | 25                    | 0.167                  | 0.000                  | 0.000                  | 356                 | 1,317             |
| Recreational Equipment | Off-Road Motorcycles Active          | G4          | 25    | U                       | NHH                      | 40                    | 0.269                  | 0.000                  | 0.001                  | 574                 | 2,125             |
| Recreational Equipment | Off-Road Motorcycles Active          | G4          | 50    | U                       | NHH                      | 41                    | 0.280                  | 0.000                  | 0.001                  | 598                 | 2,213             |
| Recreational Equipment | Off-Road Motorcycles Inactive        | G2          | 15    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 73                  | 271               |
| Recreational Equipment | Off-Road Motorcycles Inactive        | G2          | 25    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 63                  | 233               |
| Recreational Equipment | Off-Road Motorcycles Inactive        | G2          | 50    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 512                 | 1,895             |
| Recreational Equipment | Off-Road Motorcycles Inactive        | G2          | 120   | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 245                 | 906               |
| Recreational Equipment | Off-Road Motorcycles Inactive        | G4          | 15    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 142                 | 527               |
| Recreational Equipment | Off-Road Motorcycles Inactive        | G4          | 25    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 230                 | 851               |
| Recreational Equipment | Off-Road Motorcycles Inactive        | G4          | 50    | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 239                 | 887               |
| Recreational Equipment | Snowmobiles Active                   | G2          | 25    | U                       | NHH                      | 6                     | 0.017                  | 0.000                  | 0.000                  | 33                  | 5                 |
| Recreational Equipment | Snowmobiles Active                   | G2          | 50    | U                       | NHH                      | 56                    | 0.150                  | 0.003                  | 0.000                  | 156                 | 25                |
| Recreational Equipment | Snowmobiles Active                   | G2          | 120   | U                       | NHH                      | 148                   | 0.468                  | 0.007                  | 0.000                  | 284                 | 45                |



| Class of Equipment            | Equipment                     | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-------------------------------|-------------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                               |                               | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Recreational Equipment        | Snowmobiles Inactive          | G2             | 25    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 12                     | 2                    |
| Recreational Equipment        | Snowmobiles Inactive          | G2             | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 54                     | 9                    |
| Recreational Equipment        | Snowmobiles Inactive          | G2             | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 99                     | 16                   |
| Recreational Equipment        | Specialty Vehicles Carts      | G2             | 15    | U                          | NHH                         | 51                       | 0.264                     | 0.000                     | 0.000                     | 755                    | 137                  |
| Recreational Equipment        | Specialty Vehicles Carts      | G4             | 5     | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 23                     | 4                    |
| Recreational Equipment        | Specialty Vehicles Carts      | G4             | 15    | U                          | NHH                         | 23                       | 0.111                     | 0.000                     | 0.000                     | 317                    | 58                   |
| Recreational Equipment        | Specialty Vehicles Carts      | G4             | 25    | U                          | NHH                         | 35                       | 0.165                     | 0.000                     | 0.000                     | 174                    | 32                   |
| Transport Refrigeration Units | Transport Refrigeration Units | G4             | 15    | U                          | NHH                         | 84                       | 0.404                     | 0.000                     | 0.000                     | 69                     | 142                  |
| Transport Refrigeration Units | Transport Refrigeration Units | D              | 15    | U                          | NHH                         | 85                       | 0.932                     | 0.000                     | 0.000                     | 82                     | 232                  |
| Transport Refrigeration Units | Transport Refrigeration Units | D              | 25    | U                          | NHH                         | 54                       | 0.593                     | 0.000                     | 0.000                     | 31                     | 87                   |
| Transport Refrigeration Units | Transport Refrigeration Units | D              | 50    | U                          | NHH                         | 2,857                    | 30.792                    | 0.010                     | 0.000                     | 591                    | 2,378                |

**Irrigation Pumps**  
**Greenhouse Gas Inventory, 2008 Base Year**  
**Agriculture Sector**

130 Irrigation Pumps.xlsx



CO2 emissions from Shasta County in 2003  
average growth factor for irrigation pump usage in state  
years between 2003 and 2008  
CO2 emissions from Shasta County in 2008  
time conversion rate  
mass conversion rate  
CO2 emissions from Shasta County in 2008

| <u>value</u> | <u>units</u> | <u>source</u>                 |
|--------------|--------------|-------------------------------|
| 23.3         | tons/day     | Ref 13, Table D-9 on pg. D-17 |
| -0.26%       | %            | Ref 13, Table D-8 on pg. D-15 |
| 5            | years        | calculation                   |
| 23.0         | tons/day     | prorated calculation          |
| 365          | days/year    | 6.0 Unit Conversions.xlsx     |
| 1.1023       | ton/MT       | 6.0 Unit Conversions.xlsx     |
| 7,615        | MT/year      | conversion calculation        |

number of irrigation pumps in Shasta County in 2003  
portable  
stationary  
total  
number of irrigation pumps in Shasta County in 2008

| <u>value</u> | <u>units</u> | <u>source</u>                |
|--------------|--------------|------------------------------|
| 33           | pumps        | Ref 13, Table D-2 on pg. D-5 |
| 81           | pumps        | Ref 13, Table D-2 on pg. D-5 |
| 114          | pumps        | summation                    |
| 113          | pumps        | prorated calculation         |



Fertilizer Application  
Greenhouse Gas Inventory, 2008 Base Year  
Agriculture Sector  
150 Fertilizer Application.xlsx

|  | <u>Mint</u> | <u>Misc. Crops</u> | <u>Grass</u> | <u>Alfalfa</u> | <u>Timothy Hay</u>               | <u>Other Hay</u> | <u>Pasture</u> | <u>Walnuts</u> | <u>Christmas Trees</u> | <u>units</u> | <u>source</u>                        |
|--|-------------|--------------------|--------------|----------------|----------------------------------|------------------|----------------|----------------|------------------------|--------------|--------------------------------------|
| Nitrogen Applied Per Year, 2008                                  | 127         | 4                  | 56           | 15             | 4                                | 32               | 9,820          | 85             | 4                      | MT/year      | Sheet 1, N-Fertilizer Application    |
| mass conversion rate   | 1,000,000   | 1,000,000          | 1,000,000    | 1,000,000      | 1,000,000                        | 1,000,000        | 1,000,000      | 1,000,000      | 1,000,000              | g/MT         | 6.0 Unit Conversions.xlsx            |
| Nitrogen Applied Per Year, 2008                                  | 127,005,864 | 3,538,020          | 56,245,454   | 14,968,548     | 4,354,487                        | 31,751,466       | 9,820,274,811  | 85,275,366     | 3,682,561              | g/year       | conversion calculation               |
| Emission Rate - Nitrogen emitted as N2O                          | 0.0125      | 0.0125             | 0.0125       | 0.0125         | 0.0125                           | 0.0125           | 0.0125         | 0.0125         | 0.0125                 | g/g          | Ref 22, Equations 1 and 2 on pg. 363 |
| global warming potential of N2O                                  | 310         | 310                | 310          | 310            | 310                              | 310              | 310            | 310            | 310                    | unitless     | 6.0 Unit Conversions.xlsx            |
| N2O emissions, expressed in CO2-e                                | 492         | 14                 | 218          | 58             | 17                               | 123              | 38,054         | 330            | 14                     | MT/year      | calculation                          |
|  |             |                    | <u>value</u> | <u>units</u>   | <u>source</u>                    |                  |                |                |                        |              |                                      |
| Total CO2-e Emissions from Nitrogen Application - All Crop types |             |                    | 39,320       | MT/year        | summation                        |                  |                |                |                        |              |                                      |
| Total area applied with fertilizer                               |             |                    | 10,170       | MT/year        | wksht: N-Fertilizer Appl by Crop |                  |                |                |                        |              |                                      |

Nitrogen-Based Fertilizer Application Rates by Crop Type, 2008



|   |              |              |   |              |
|---|--------------|--------------|---|--------------|
| <b>Mint (peppermint)</b>  | <u>value</u> | <u>units</u> | <u>source</u>                                     | <u>notes</u> |
| area harvested in 2008, bearing   | 1,400        | acres        | Ref 04  |              |
| Nitrogen application rate for fertilization of established plantings, bearing | 200          | lb/acre      | Dr. Daniel Marcum, Farm Advisor, UC CocSee Note 6 |              |
| Total nitrogen applied  | 280,000      | lb/year      | calculation                                       |              |
| mass conversion rate  | 2,205        | lb/MT        | 6.0 Unit Conversions.xlsx                         |              |
| Total nitrogen applied  | 127.0        | MT/year      | conversion calculation                            |              |
|   |              |              |   |              |
| <b>Misc Crops (grain, seeds, truck crops, etc.)</b>                           | <u>value</u> | <u>units</u> | <u>source</u>                                     | <u>notes</u> |
| area harvested in 2008, bearing   | 75           | acres        | See Note 4  |              |
| type of nitrogen-containing fertilizer used (N-P-K) (bloodmeal)               | 13-0-0       | N-P-K %s     | Ref 25, pg. 4, assuming tomatoes                  |              |
| percentage Nitrogen, by mass  | 13%          | %            | Ref 25, pg. 4, assuming tomatoes                  |              |
| Application rate of nitrogen-based fertilizer (bloodmeal)                     | 800          | lb/acre      | Ref 25, pg. 4, assuming tomatoes                  |              |
| Nitrogen application rate   | 104          | lb/acre      | calculation                                       |              |
| Total nitrogen applied  | 7,800        | lb/year      | calculation                                       |              |
| mass conversion rate  | 2,205        | lb/MT        | 6.0 Unit Conversions.xlsx                         |              |
| Total nitrogen applied  | 3.5          | MT/year      | conversion calculation                            |              |
|   |              |              |   |              |
| <b>Alfalfa</b>  | <u>value</u> | <u>units</u> | <u>source</u>                                     | <u>notes</u> |
| area harvested in 2008, bearing   | 3,000        | acres        | Ref 04  |              |
| type of nitrogen-containing fertilizer used (N-P-K)                           | 11-52-0      | N-P-K %s     | Ref 15, pg. 3; Ref 18, pg. 3                      |              |
| percentage Nitrogen, by mass  | 11%          | %            | Ref 15, pg. 3; Ref 18, pg. 3                      |              |
| Nitrogen application rate for fertilization of established plantings          | 200          | lb/acre      | Ref 15, pg. 3; Ref 18, pg. 3                      |              |
| frequency of application  | 0.5          | appl./year   | Ref 15, pg. 3; Ref 18, pg. 3                      |              |
| Total nitrogen applied  | 33,000       | lb/year      | calculation                                       |              |
| mass conversion rate  | 2,205        | lb/MT        | 6.0 Unit Conversions.xlsx                         |              |
| Total nitrogen applied  | 15.0         | MT/year      | conversion calculation                            |              |
|   |              |              |   |              |
| <b>Grass</b>  | <u>value</u> | <u>units</u> | <u>source</u>                                     | <u>notes</u> |
| area harvested in 2008, bearing   | 3,100        | acres        | Ref 04  |              |
| Nitrogen application rate for fertilization                                   |              |              |   | See Note 2   |
| Nitrogen-containing fertilizer  | 40           | lb/acre      | Ref 17, pg. 3                                     |              |
| urea  | 200          | lb/acre      | Ref 17, pg. 3                                     | See Note 1   |
| mass conversion rate  | 2,205        | lb/MT        | 6.0 Unit Conversions.xlsx                         |              |
| Total nitrogen applied  | 56.2         | MT/year      | conversion calculation                            |              |
|   |              |              |   |              |
| <b>Timothy Hay/Grass</b>  | <u>value</u> | <u>units</u> | <u>source</u>                                     | <u>notes</u> |
| area harvested in 2008, bearing   | 2,400        | acres        | Ref 04  |              |
| Nitrogen application rate for fertilization                                   | 20           | lb/acre      | Ref 16, pg. 3                                     |              |
| frequency of application  | 0.2          | appl./year   | Ref 16, pg. 3                                     |              |
| Total nitrogen applied  | 9,600        | lb/year      | calculation                                       |              |
| mass conversion rate  | 2,205        | lb/MT        | 6.0 Unit Conversions.xlsx                         |              |
| Total nitrogen applied  | 4.4          | MT/year      | conversion calculation                            |              |

Nitrogen-Based Fertilizer Application Rates by Crop Type, 2008



| Other Hay                               | value  | units   | source                    | notes |
|---|--------|---------|---------------------------|-------|
| area harvested in 2008, bearing         | 1,400  | acres   | Ref 04                    |       |
| Nitrogen application rates, by hay type |        |         |                           |       |
| grain hay                               | 80     | lb/acre | Ref 19, pg. 3             |       |
| Timothy hay                             | 20     | lb/acre | Ref 16, pg. 3             |       |
| average                                 | 50     | lb/acre | average calculation       |       |
| Total nitrogen applied                  | 70,000 | lb/year | calculation               |       |
| mass conversion rate                    | 2,205  | lb/MT   | 6.0 Unit Conversions.xlsx |       |
| Total nitrogen applied                  | 31.8   | MT/year | conversion calculation    |       |

| Pasture                                     | value      | units   | source                                  | notes      |
|---|------------|---------|---|------------|
| Area of pasture, by type                    |            |         |   |            |
| irrigated                                   | 33,000     | acres   | Ref 04                                  | See Note 3 |
| improved                                    | 100,000    | acres   | Ref 04                                  |            |
| rangeland                                   | 325,000    | acres   | Ref 04                                  |            |
| Nitrogen application rate for fertilization |            |         |   | See Note 1 |
| irrigated                                   | 50         | lb/acre | Dr. Daniel Marcum, Farm Advisor, UC Cor | See Note 6 |
| improved                                    | 200        | lb/acre | Dr. Daniel Marcum, Farm Advisor, UC Cor | See Note 6 |
| rangeland                                   | 0          | lb/acre | Dr. Daniel Marcum, Farm Advisor, UC Cor | See Note 6 |
| Total nitrogen applied                      | 21,650,000 | lb/year | calculation                             |            |
| mass conversion rate                        | 2,205      | lb/MT   | 6.0 Unit Conversions.xlsx               |            |
| Total nitrogen applied                      | 9,820      | MT/year | conversion calculation                  |            |

| Walnuts   | value | units   | source                    | notes |
|---|-------|---------|---------------------------|-------|
| area harvested in 2008, bearing   | 940   | acres   | Ref 04                    |       |
| Nitrogen application rate for fertilization of established plantings, bearing | 200   | lb/acre | Ref 21, pg. 4             |       |
| mass conversion rate  | 2,205 | lb/MT   | 6.0 Unit Conversions.xlsx |       |
| Total nitrogen applied  | 85.3  | MT/year | conversion calculation    |       |

| Christmas Trees   | Douglas fir | White fir | units      | source                                 |
|---|-------------|-----------|------------|--|
| Number of trees sold, all types                                       | 13,975      |           | #          | Ref 04                                 |
| Proportion of trees, by species type                                  | 50%         | 50%       | %          | assumption                             |
| Number of trees sold, by type   | 6,988       | 6,988     | #          | calculation                            |
| Years of growth before harvested                                      | 8           | 10        | years      | Ref 24, Table B on pg. 5               |
| Density of tree plantings   | 1,742       | 1,742     | trees/acre | Ref, 24, pg. 4                         |
| Number of acres planted in Shasta County, by species type             | 64          | 80        | acres      | calculation                            |
| Number of years when fertilizer not applied (i.e., first X years)     | 3           | 4         | years      | Ref, 24, pg. 4                         |
| Number of years when fertilizer not applied (i.e., remaining Y years) | 5           | 6         | years      | subtraction                            |
| Nitrogen application rate for fertilization of established plantings  | 92          | 92        | lb/acre    | Ref, 24, pg. 4                         |
| Average nitrogen application rate for fertilization                   | 58          | 55        | lb/acre    | calculation, average weighted by years |
| Mass of nitrogen applied in Shasta County                             | 3,690       | 4,428     | lb/year    | calculation                            |
| Total   | 8,119       |           | lb/year    | summation                              |
| mass conversion rate  | 2,205       |           | lb/MT      | 6.0 Unit Conversions.xlsx              |
| Total nitrogen applied  | 4           |           | MT/year    | conversion calculation                 |



Nitrogen-Based Fertilizer Application Rates by Crop Type, 2008



| Strawberry Nursery Plants (nursery stock, for replanting elsewhere) | value      | units   | source  | notes |
|---|------------|---------|---|-------|
| area harvested  | 288        | acres   | Ref 04  |       |
| units harvested   | 86,688,000 | units   | Ref 04  |       |
| Nitrogen application rate   | 175        | lb/acre | Dr. Daniel Marcum, Farm Advisor, UC CocSee Note 6 |       |
| Total nitrogen applied  | 50,400     | lb/year | calculation                                       |       |
| mass conversion rate  | 2,205      | lb/MT   | 6.0 Unit Conversions.xlsx                         |       |
| Total nitrogen applied  | 22.9       | MT/year | conversion calculation                            |       |

| Summary   | value  | units   | source    |
|---|--------|---------|-----------|
| Total Nitrogen Application in Shasta County, 2008 | 10,170 | MT/year | summation |

The following commodities are also grown in Shasta County but the rate of fertilization application is not available from published reports.

|   | value       | units | source |
|---|-------------|-------|--------|
| Other nursery stock (turf, ornamentals, mint, etc.) | 13,975      | units | Ref 04 |
| Fruit & Nut crops (not including walnuts)           | \$1,789,500 | \$    | Ref 04 |

Notes

- 1
- According to Ref 17, urea is applied to soils for the establishment of orchard grass; however, because emissions associated with application of urea are accounted for on 151 Urea.xlsx, these emission are not accounted for on this worksheet.
- 2
- It is assumed that the nitrogen application rates for grass are the same as for orchardgrass.
- 3
- Based on phone conversations with John Ingram, Ag investigator at Shasta County Dept of Ag, on February 8 and 9, 2011, it is assumed that only irrigated pasturelands are fertilized. The acreage levels for improved pastureland and rangeland are shown for disclosure purposes only.
- 4
- This acreage is assumed based on phone conversations with John Ingram, Ag investigator at Shasta County Dept of Ag, on February 8 and 9, 2011. John stated that these crops are typically reported in rows, not acres, which makes them difficult for the County to track. The harvests of these crops are typically sold locally (e.g., farmers markets).
- 5
- It is assumed that all walnut orchards are mature (7 years or older) and bearing.
- 6
- Dr. Daniel Marcum of UC Agricultural Extension, Shasta County may provide input that results in refinements to some of these values. For instance he may have insight about whether some of the nitrogen application is in the form of urea or lime, which means there is double-counting across sheets 150, 151, and 152.

**Additional Notes from Phone Conversation with John Ingram, Ag investigator at Shasta County Dept of Ag, Redding, CA**  
February 8 and 9, 2011



Organic Crops

General: How many acres of each crop type are being produced organically? Ask Ag Commissioner?

John Ingram guesses that very little acreage is organic, certainly less than 5% of total crop acreage.

Mint Production

peppermint or spearmint?

peppermint

Is fertilizer applied? Is there any guidance about how much fertilizer to use?

unknown, would need to talk to growers

Where is oil extracted from the harvested mint? What location?

the Mint Still is located in McArthur

Would any particular crop be planted instead of mint as mint acreage is reduced?

timothy grass hay, orchard grass, alfalfa mix

How much mint production is projected in Shasta County in the future?

rapid decline, prices falling, 800 acres still in production today, there is an oil surplus on the market

Walnuts

Is there a trend? Are more walnut orchards being planted?

No more walnut orchards can be planted in Shasta County because there is a very limited area where walnut production is feasible.

**Urea Application**  
**Greenhouse Gas Inventory, 2008 Base Year**  
**Agriculture Sector**  
 151 Urea Application.xlsx



|                                    | <u>value</u> | <u>units</u> | <u>source</u>   |
|------------------------------------|--------------|--------------|---|
| mass of urea sold in Shasta County | 3,560        | tons/year    | Ref 23, p. 5 (sheet 24), table produced 12/9/2009; See Note 1 |
| mass conversion rate               | 1.1023       | ton/MT       | 6.0 Unit Conversions.xlsx                                     |
| mass of urea sold in Shasta County | 3,230        | MT/year      | conversion calculation  |
| emission factor                    | 0.20         | MT C/MT urea | Ref 24, p. 11.32, Equation 11.13                              |
| mass of carbon emitted             | 646          | MT/year      | calculation based on Equation 11.13 from Ref 23               |
| molecular mass of CO <sub>2</sub>  | 44.01        | g/mol        | Ref 24, p. 11.32, Equation 11.13                              |
| atomic mass of C                   | 12.011       | g/mol        | periodic table  |
| molecular mass ratio               | 3.664        | unitless     | ratio calculation   |
| Emissions of CO <sub>2</sub>       | 2,367        | MT/year      | calculation based on Equation 11.13 from Ref 23               |

Notes

- 1 It is assumed that the quantity of urea used in Shasta County is equivalent to the quantity sold in the County.

## Lime Application

### Greenhouse Gas Inventory, 2008 Base Year

#### Agriculture Sector

152 Lime Application.xlsx



|                                    | <u>value</u> | <u>units</u> | <u>source</u>   |
|------------------------------------|--------------|--------------|---|
| mass of lime sold in Shasta County | 22,508       | tons/year    | Ref 23, p. 7 (sheet 26), table produced 12/9/2009; See Note 1 |
| mass conversion rate               | 1.1023       | ton/MT       | 6.0 Unit Conversions.xlsx                                     |
| mass of lime sold in Shasta County | 20,419       | MT/year      | conversion calculation  |
| emission factor                    | 0.12         | MT C/MT urea | Ref 24, p. 11.32, Equation 11.13                              |
| mass of carbon emitted             | 2,450        | MT/year      | calculation based on Equation 11.12 from Ref 23               |
| molecular mass of CO <sub>2</sub>  | 44.01        | g/mol        | Ref 24, p. 11.32, Equation 11.13                              |
| atomic mass of C                   | 12.011       | g/mol        | periodic table  |
| molecular mass ratio               | 3.664        | unitless     | ratio calculation   |
| Emissions of CO <sub>2</sub>       | 8,978        | MT/year      | calculation based on Equation 11.12 from Ref 23               |

#### Notes

- 1 It is assumed that the quantity of lime used in Shasta County is equivalent to the quantity sold in the County.



|                          | <u>methyl</u>  | <u>sulfuryl</u> |              |                           |
|--------------------------|----------------|-----------------|--------------|---------------------------|
|                          | <u>bromide</u> | <u>fluoride</u> | <u>units</u> | <u>source</u>             |
| mass of pesticide        | 56,970         | 175             | lb/year      | Sheet 1, raw              |
| mass conversion factor   | 2,204.62       | 2,204.62        | lb/MT        | 6.0 Unit Conversions.xlsx |
| global warming potential | 5              | 3,860           | unitless     | See Note 3                |
| CO2-e, annual            | 129            | 306             | MT/year      | calculation               |
| Total                    | 436            |                 | MT/year      | summation                 |

Notes

- 1

Based on uncertain data, the GWP for SO2F2 (i.e., its warming potential relative to CO2) is estimated to range from 120-7600 for a 100 year time horizon, according to Sulbaek Andersen MP, Blake DR, Rowland FS, Hurley MD and Wallington TJ, Atmospheric chemistry of sulfuryl fluoride: reaction with OH radicals, Cl atoms and O3, atmospheric lifetime, IR spectrum, and global warming potential, *Environ. Sci. Technol.* , 2009, 43, 1067-1070 (Ref 11) (as cited at [http://ozone.unep.org/Assessment\\_Panels/EEAP/EEAP-Progress-report-2009.pdf](http://ozone.unep.org/Assessment_Panels/EEAP/EEAP-Progress-report-2009.pdf)). Thus, the range in CO2-e emissions is estimated as follows:
- |                                    | <u>low</u> | <u>high</u> | <u>average</u> |
|------------------------------------|------------|-------------|----------------|
| Range of GWP for sulfuryl fluoride | 120        | 7600        | 3860           |
| CO2e, annual in Shasta County      | 9.5        | 603.3       | 306            |
| Total pesticide CO2-e, annual      | 139        | 732         | 436            |
- 2

According to Ref 10, the global warming potential for sulfuyl fluoride is similar to CFC-11, which is approximately 4,780.
- 3

For methyl bromide, Ref 09, Table 2.14 on pg. 212; For sulfuryl fluoride, see Note 1 and Note 2.



|                          | <u>Walnuts</u> | <u>Wild rice</u> | <u>Hay grass</u> | <u>Alfalfa</u> | <u>Other hay</u> | <u>Timothy hay</u> | <u>Mint</u> | <u>Misc crops</u><br><u>(grain, seed,</u><br><u>truck crops)</u> | <u>Other fruit and</u><br><u>nut orchard</u><br><u>(apples, olives,</u><br><u>stone fruit,</u><br><u>grapes, kiwis,</u><br><u>pistachios)</u> | <u>units</u>         | <u>source</u>                                |
|--------------------------|----------------|------------------|------------------|----------------|------------------|--------------------|-------------|--|---|----------------------|--|
| Area Harvested           | 940            | 6,300            | 3,100            | 3,000          | 14,000           | 2,400              | 1,400       | unknown  | unknown   | acres/year           | Ref 04                                       |
| Residue Burned           | 1.2            | 3                |                  |                |                  |                    |             |  |   | ton/acre             | Ref 08 - Annex D Ag Residue Burning          |
| Fraction of area burned  | 0.95           | 0.177            |                  |                |                  |                    |             |  |   | fraction             | Ref 08 - Annex D Ag Residue Burning          |
| Residue moisture content | 0.331          | 0.086            |                  |                |                  |                    |             |  |   | unitless             | Ref 08 - Annex D Ag Residue Burning          |
| Emission Factors         |                |                  |                  |                |                  |                    |             |  |   |                      |  |
| CO2                      | 1.64           | 1.16             |                  |                |                  |                    |             |  |   | ton emiss/ton burned | Ref 08 - Annex D Ag Residue Burning          |
| CH4                      | 0.00164        | 0.00072          |                  |                |                  |                    |             |  |   | ton emiss/ton burned | Ref 08 - Annex D Ag Residue Burning          |
| N2O                      | 0.0002         | 0.0002           |                  |                |                  |                    |             |  |   | ton emiss/ton burned | Ref 08 - Annex D Ag Residue Burning          |
| Emissions                |                |                  |                  |                |                  |                    |             |  |   |                      |  |
| CO2                      | 1,175.72       | 3,546.82         |                  |                |                  |                    |             |  |   | ton/year             | calculation based on Equation 53 from Ref 08 |
| CH4                      | 1.18           | 2.20             | See              | See            | See              | See                | See         | See  | See   | ton/year             | calculation based on Equation 53 from Ref 08 |
| N2O                      | 0.14           | 0.61             | Note 1           | Note 1         | Note 1           | Note 1             | Note 1      | Note 1   | Note 1  | ton/year             | calculation based on Equation 53 from Ref 08 |
| Global warming potential |                |                  |                  |                |                  |                    |             |  |   |                      |  |
| CO2                      | 1              | 1                |                  |                |                  |                    |             |  |   | unitless             | 6.0 Unit Conversions.xlsx                    |
| CH4                      | 21             | 21               |                  |                |                  |                    |             |  |   | unitless             | 6.0 Unit Conversions.xlsx                    |
| N2O                      | 310            | 310              |                  |                |                  |                    |             |  |   | unitless             | 6.0 Unit Conversions.xlsx                    |
| mass conversion rate     | 1.1023         | 1.1023           |                  |                |                  |                    |             |  |   | ton/MT               | 6.0 Unit Conversions.xlsx                    |
| Emissions                |                |                  |                  |                |                  |                    |             |  |   |                      |  |
| CO2, expressed as CO2-e  | 1,067          | 3,218            |                  |                |                  |                    |             |  |   | MT/year              | conversion calculation                       |
| CH4, expressed as CO2-e  | 22             | 42               |                  |                |                  |                    |             |  |   | MT/year              | conversion calculation                       |
| N2O, expressed as CO2-e  | 40             | 172              |                  |                |                  |                    |             |  |   | MT/year              | conversion calculation                       |
| CO2-e                    | 1,129          | 3,432            |                  |                |                  |                    |             |  |   | MT/year              | summation                                    |
| Total CO2-e Emissions    | 4,561          |                  |                  |                |                  |                    |             |  |   |                      |  |

Notes

- 1
- It is assumed that residue from these crops is not burned because they are not included in the Statewide GHG inventory (Ref 08).
- 2
- It is assumed that the emission rates for wild rice is the same as for regular rice.

**Rice Field Decomposition**  
**Greenhouse Gas Inventory, 2008 Base Year**  
**Agriculture Sector**  
190 Rice Field Decomposition.xlsx



The emissions estimated on this worksheet are associated with the organic decomposition of organic material in flooded rice fields. This does not include emissions associated with fertilizer use, off-road equipment, or field burning.

|                                 | <u>value</u> | <u>units</u> | <u>source</u>                        |
|---------------------------------|--------------|--------------|--------------------------------------|
| Area of wild rice cultivation   | 6,300        | acres/year   | Ref 04                               |
| area conversion rate            | 0.405        | ha/acre      | 6.0 Unit Conversion.xlsx             |
| Area of wild rice cultivation   | 2,550        | ha/acre      | conversion calculation               |
| CH4 emission rate               | 122          | kg/ha        | Ref 06; Ref 08, Annex 3G; See Note 1 |
| CH4 emissions                   | 311,041      | kg/year      | calculation                          |
| mass conversion rate            | 1,000        | kg/MT        | 6.0 Unit Conversion.xlsx             |
| global warming potential of CH4 | 21           | unitless     | 6.0 Unit Conversion.xlsx             |
| CH4 emissions                   | 6,532        | MT/year      | conversion calculation               |

Notes

1

It is assumed that the emission rate for wild rice is the same as for regular rice.



**Summary of Greenhouse Gas Emissions from Off-Road Vehicles and Equipment (MT CO<sub>2</sub>-e)**

|                                    | Redding | Anderson | Shasta Lake | Unincorp.<br>County | County Total | Source                                   |
|------------------------------------|---------|----------|-------------|---------------------|--------------|--|
| <b>2008 Base Year</b>              |         |          |             |                     |              |  |
| Transportation Refrigeration Units | 5,434   | 635      | 617         | 4,257               | 10,943       | 201 TRUs.xlsx                            |
| Light Commercial Equipment         | 3,184   | 372      | 362         | 2,494               | 6,411        | 220 Light Commercial Equipment.xlsx      |
| Lawn and Garden Equipment          | 1,521   | 178      | 173         | 1,192               | 3,064        | 230 Lawn and Garden Equipment.xlsx       |
| Construction & Mining Equipment    | 27,268  | 3,187    | 3,097       | 21,360              | 54,912       | 240 Construction & Mining Equipment.xlsx |
| Total                              | 37,407  | 4,372    | 4,249       | 29,302              | 75,330       | summation                                |
| <b>Year 2020 Projections</b>       |         |          |             |                     |              |  |
| Transportation Refrigeration Units | 9,810   | 1,147    | 1,114       | 7,685               | 19,756       | 201 TRUs.xlsx                            |
| Light Commercial Equipment         | 3,402   | 398      | 386         | 2,665               | 6,850        | 220 Light Commercial Equipment.xlsx      |
| Lawn and Garden Equipment          | 1,602   | 187      | 182         | 1,255               | 3,227        | 230 Lawn and Garden Equipment.xlsx       |
| Construction & Mining Equipment    | 32,458  | 3,794    | 3,686       | 25,426              | 65,364       | 240 Construction & Mining Equipment.xlsx |
| Total                              | 47,272  | 5,525    | 5,369       | 37,030              | 95,197       | summation                                |
| <b>Year 2035 Projections</b>       |         |          |             |                     |              |  |
| Transportation Refrigeration Units | 20,764  | 2,427    | 2,358       | 16,265              | 41,814       | 201 TRUs.xlsx                            |
| Light Commercial Equipment         | 3,759   | 439      | 427         | 2,945               | 7,571        | 220 Light Commercial Equipment.xlsx      |
| Lawn and Garden Equipment          | 1,817   | 212      | 206         | 1,423               | 3,659        | 230 Lawn and Garden Equipment.xlsx       |
| Construction & Mining Equipment    | 39,034  | 4,563    | 4,433       | 30,577              | 78,607       | 240 Construction & Mining Equipment.xlsx |
| Total                              | 65,374  | 7,641    | 7,425       | 51,210              | 131,650      | summation                                |
| <b>Year 2050 Projections</b>       |         |          |             |                     |              |  |
| Transportation Refrigeration Units | 26,681  | 3,119    | 3,030       | 20,900              | 53,729       | 201 TRUs.xlsx                            |
| Light Commercial Equipment         | 3,881   | 454      | 441         | 3,040               | 7,816        | 220 Light Commercial Equipment.xlsx      |
| Lawn and Garden Equipment          | 1,888   | 221      | 214         | 1,479               | 3,801        | 230 Lawn and Garden Equipment.xlsx       |
| Construction & Mining Equipment    | 41,218  | 4,818    | 4,681       | 32,288              | 83,005       | 240 Construction & Mining Equipment.xlsx |
| Total                              | 73,667  | 8,611    | 8,367       | 57,706              | 148,351      | summation                                |

| Class of Equipment     | Equipment                    | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|------------------------|------------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                        |                              | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 5     | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 10                     | 4                    |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 15    | U                          | NHH                         | 5                        | 0.025                     | 0.000                     | 0.000                     | 12                     | 11                   |
| Agricultural Equipment | 2-Wheel Tractors             | G4             | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Agricultural Mowers          | G4             | 15    | U                          | NHH                         | 2                        | 0.009                     | 0.000                     | 0.000                     | 11                     | 5                    |
| Agricultural Equipment | Agricultural Mowers          | G4             | 25    | U                          | NHH                         | 4                        | 0.017                     | 0.000                     | 0.000                     | 9                      | 4                    |
| Agricultural Equipment | Agricultural Mowers          | D              | 120   | U                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Agricultural Tractors        | G4             | 120   | U                          | NHH                         | 25                       | 0.218                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Agricultural Equipment | Agricultural Tractors        | G4             | 175   | U                          | NHH                         | 5                        | 0.044                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Agricultural Equipment | Agricultural Tractors        | D              | 15    | U                          | NHH                         | 73                       | 0.795                     | 0.000                     | 0.000                     | 103                    | 151                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 25    | U                          | NHH                         | 171                      | 1.878                     | 0.000                     | 0.000                     | 128                    | 186                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 50    | U                          | NHH                         | 605                      | 6.631                     | 0.000                     | 0.000                     | 297                    | 388                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 120   | U                          | NHH                         | 1,486                    | 16.320                    | 0.000                     | 0.000                     | 344                    | 448                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 175   | U                          | NHH                         | 1,429                    | 15.725                    | 0.000                     | 0.000                     | 194                    | 253                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 250   | U                          | NHH                         | 1,313                    | 14.520                    | 0.000                     | 0.000                     | 125                    | 163                  |
| Agricultural Equipment | Agricultural Tractors        | D              | 500   | U                          | NHH                         | 426                      | 4.717                     | 0.000                     | 0.000                     | 25                     | 32                   |
| Agricultural Equipment | Balers                       | G4             | 50    | U                          | NHH                         | 4                        | 0.038                     | 0.000                     | 0.000                     | 12                     | 2                    |
| Agricultural Equipment | Balers                       | G4             | 120   | U                          | NHH                         | 4                        | 0.035                     | 0.000                     | 0.000                     | 6                      | 1                    |
| Agricultural Equipment | Balers                       | D              | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Balers                       | D              | 120   | U                          | NHH                         | 6                        | 0.069                     | 0.000                     | 0.000                     | 10                     | 3                    |
| Agricultural Equipment | Combines                     | G4             | 120   | U                          | NHH                         | 2                        | 0.019                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment | Combines                     | G4             | 175   | U                          | NHH                         | 2                        | 0.016                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Combines                     | G4             | 250   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Combines                     | D              | 120   | U                          | NHH                         | 13                       | 0.142                     | 0.000                     | 0.000                     | 7                      | 3                    |
| Agricultural Equipment | Combines                     | D              | 175   | U                          | NHH                         | 25                       | 0.276                     | 0.000                     | 0.000                     | 11                     | 4                    |
| Agricultural Equipment | Combines                     | D              | 250   | U                          | NHH                         | 38                       | 0.416                     | 0.000                     | 0.000                     | 12                     | 5                    |
| Agricultural Equipment | Combines                     | D              | 500   | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 5     | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 15    | U                          | NHH                         | 3                        | 0.013                     | 0.000                     | 0.000                     | 5                      | 6                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 25    | U                          | NHH                         | 2                        | 0.011                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 50    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | G4             | 120   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Hydro Power Units            | D              | 15    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Agricultural Equipment | Hydro Power Units            | D              | 25    | U                          | NHH                         | 1                        | 0.015                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Agricultural Equipment | Hydro Power Units            | D              | 50    | U                          | NHH                         | 3                        | 0.031                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Agricultural Equipment | Hydro Power Units            | D              | 120   | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 5     | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 50    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 120   | U                          | NHH                         | 3                        | 0.023                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 175   | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | G4             | 250   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 15    | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 25    | U                          | NHH                         | 3                        | 0.035                     | 0.000                     | 0.000                     | 4                      | 5                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 50    | U                          | NHH                         | 4                        | 0.047                     | 0.000                     | 0.000                     | 4                      | 4                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 120   | U                          | NHH                         | 29                       | 0.320                     | 0.000                     | 0.000                     | 12                     | 13                   |
| Agricultural Equipment | Other Agricultural Equipment | D              | 175   | U                          | NHH                         | 4                        | 0.048                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 250   | U                          | NHH                         | 6                        | 0.070                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Agricultural Equipment | Other Agricultural Equipment | D              | 500   | U                          | NHH                         | 2                        | 0.024                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment | Sprayers                     | G4             | 5     | U                          | NHH                         | 2                        | 0.010                     | 0.000                     | 0.000                     | 40                     | 11                   |
| Agricultural Equipment | Sprayers                     | G4             | 15    | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 12                     | 3                    |
| Agricultural Equipment | Sprayers                     | G4             | 25    | U                          | NHH                         | 7                        | 0.035                     | 0.000                     | 0.000                     | 32                     | 9                    |
| Agricultural Equipment | Sprayers                     | G4             | 50    | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment | Sprayers                     | G4             | 120   | U                          | NHH                         | 3                        | 0.025                     | 0.000                     | 0.000                     | 4                      | 1                    |

| Class of Equipment               | Equipment           | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------------|---------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                  |                     | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Agricultural Equipment           | Sprayers            | G4             | 175   | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 25    | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Agricultural Equipment           | Sprayers            | D              | 50    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 120   | U                          | NHH                         | 3                        | 0.032                     | 0.000                     | 0.000                     | 5                      | 1                    |
| Agricultural Equipment           | Sprayers            | D              | 175   | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 250   | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Agricultural Equipment           | Sprayers            | D              | 500   | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Swathers            | G4             | 120   | U                          | NHH                         | 14                       | 0.127                     | 0.000                     | 0.000                     | 12                     | 3                    |
| Agricultural Equipment           | Swathers            | G4             | 175   | U                          | NHH                         | 15                       | 0.138                     | 0.000                     | 0.000                     | 10                     | 2                    |
| Agricultural Equipment           | Swathers            | D              | 120   | U                          | NHH                         | 39                       | 0.424                     | 0.000                     | 0.000                     | 52                     | 16                   |
| Agricultural Equipment           | Swathers            | D              | 175   | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Tillers             | G4             | 15    | U                          | NHH                         | 129                      | 0.624                     | 0.000                     | 0.001                     | 1,362                  | 265                  |
| Agricultural Equipment           | Tillers             | D              | 15    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Tillers             | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Agricultural Equipment           | Tillers             | D              | 500   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | A/C Tug Narrow Body | G4             | 175   | U                          | NHH                         | 2                        | 0.019                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | A/C Tug Narrow Body | D              | 250   | U                          | NHH                         | 7                        | 0.077                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Airport Ground Support Equipment | A/C Tug Wide Body   | G4             | 500   | U                          | NHH                         | 2                        | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | A/C Tug Wide Body   | D              | 500   | U                          | NHH                         | 4                        | 0.043                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | G4             | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | C4             | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | D              | 175   | U                          | NHH                         | 1                        | 0.013                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | D              | 250   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Conditioner     | D              | 500   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | G4             | 175   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 250   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 500   | U                          | NHH                         | 4                        | 0.049                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Air Start Unit      | D              | 750   | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Baggage Tug         | G4             | 120   | U                          | NHH                         | 19                       | 0.169                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Airport Ground Support Equipment | Baggage Tug         | C4             | 120   | U                          | NHH                         | 4                        | 0.028                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment | Baggage Tug         | D              | 120   | U                          | NHH                         | 9                        | 0.095                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Airport Ground Support Equipment | Belt Loader         | G4             | 120   | U                          | NHH                         | 4                        | 0.040                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Airport Ground Support Equipment | Belt Loader         | C4             | 120   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Belt Loader         | D              | 120   | U                          | NHH                         | 2                        | 0.022                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment | Bobtail             | G4             | 120   | U                          | NHH                         | 3                        | 0.027                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Airport Ground Support Equipment | Bobtail             | C4             | 120   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Bobtail             | D              | 120   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Loader        | G4             | 120   | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Loader        | C4             | 120   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Loader        | D              | 120   | U                          | NHH                         | 4                        | 0.047                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Airport Ground Support Equipment | Cargo Tractor       | G4             | 120   | U                          | NHH                         | 22                       | 0.189                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Airport Ground Support Equipment | Cargo Tractor       | C4             | 175   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cargo Tractor       | D              | 120   | U                          | NHH                         | 1                        | 0.010                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Cart                | G4             | 15    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Catering Truck      | G4             | 250   | U                          | NHH                         | 3                        | 0.030                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Catering Truck      | C4             | 250   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Catering Truck      | D              | 250   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Compressor (GSE)    | D              | 120   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Compressor (GSE)    | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Compressor (GSE)    | D              | 500   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Compressor (GSE)    | D              | 750   | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Deicer              | G4             | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Airport Ground Support Equipment | Forklift            | G4             | 50    | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |

| Class of Equipment                | Equipment         | Engine      | MaxHP | Commercial or           |                          | Fuel Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) | Number of Equipment | Activity (hr/day) |
|-----------------------------------|-------------------|-------------|-------|-------------------------|--------------------------|----------------------------|------------------------|------------------------|------------------------|---------------------|-------------------|
|                                   |                   | Type & Fuel |       | Residential Application | Handheld or Non-handheld |                            |                        |                        |                        |                     |                   |
| Airport Ground Support Equipment  | Forklift          | C4          | 50    | U                       | NHH                      | 1                          | 0.009                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Airport Ground Support Equipment  | Forklift          | D           | 175   | U                       | NHH                      | 0                          | 0.005                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Fuel Truck        | G4          | 175   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Fuel Truck        | C4          | 175   | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Fuel Truck        | D           | 250   | U                       | NHH                      | 0                          | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Generator         | G4          | 120   | U                       | NHH                      | 0                          | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Generator         | D           | 120   | U                       | NHH                      | 1                          | 0.006                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Generator         | D           | 175   | U                       | NHH                      | 5                          | 0.060                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Airport Ground Support Equipment  | Generator         | D           | 250   | U                       | NHH                      | 8                          | 0.090                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Airport Ground Support Equipment  | Generator         | D           | 500   | U                       | NHH                      | 1                          | 0.015                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Generator         | D           | 750   | U                       | NHH                      | 3                          | 0.033                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Ground Power Unit | G4          | 175   | U                       | NHH                      | 3                          | 0.029                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Ground Power Unit | D           | 175   | U                       | NHH                      | 12                         | 0.135                  | 0.000                  | 0.000                  | 1                   | 2                 |
| Airport Ground Support Equipment  | Hydrant truck     | G4          | 175   | U                       | NHH                      | 4                          | 0.032                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Hydrant Truck     | D           | 175   | U                       | NHH                      | 0                          | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Lav Cart          | G4          | 15    | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Lav Truck         | G4          | 175   | U                       | NHH                      | 2                          | 0.015                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Airport Ground Support Equipment  | Lav Truck         | C4          | 175   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Lav Truck         | D           | 175   | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Lift              | G4          | 120   | U                       | NHH                      | 2                          | 0.014                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Lift              | C4          | 120   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Lift              | D           | 120   | U                       | NHH                      | 1                          | 0.009                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Maint. Truck      | G4          | 175   | U                       | NHH                      | 2                          | 0.015                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Other             | C4          | 50    | U                       | NHH                      | 0                          | 0.003                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Other GSE         | G4          | 50    | U                       | NHH                      | 0                          | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Other GSE         | D           | 175   | U                       | NHH                      | 2                          | 0.022                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Passenger Stand   | G4          | 175   | U                       | NHH                      | 1                          | 0.005                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Passenger Stand   | C4          | 175   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Passenger Stand   | D           | 120   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Service Truck     | G4          | 250   | U                       | NHH                      | 5                          | 0.042                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Airport Ground Support Equipment  | Service Truck     | C4          | 250   | U                       | NHH                      | 1                          | 0.006                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Service Truck     | D           | 175   | U                       | NHH                      | 0                          | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Sweeper           | G4          | 120   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Sweeper           | C4          | 50    | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Sweeper           | D           | 120   | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Airport Ground Support Equipment  | Water Truck       | G4          | 175   | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Asphalt Pavers    | G4          | 15    | U                       | NHH                      | 0                          | 0.002                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Construction and Mining Equipment | Asphalt Pavers    | G4          | 25    | U                       | NHH                      | 2                          | 0.007                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Construction and Mining Equipment | Asphalt Pavers    | G4          | 50    | U                       | NHH                      | 1                          | 0.009                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Asphalt Pavers    | G4          | 120   | U                       | NHH                      | 1                          | 0.009                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4          | 15    | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4          | 25    | U                       | NHH                      | 1                          | 0.003                  | 0.000                  | 0.000                  | 1                   | 0                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4          | 50    | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4          | 120   | U                       | NHH                      | 1                          | 0.011                  | 0.000                  | 0.000                  | 1                   | 0                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | G4          | 175   | U                       | NHH                      | 0                          | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 15    | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 25    | U                       | NHH                      | 1                          | 0.006                  | 0.000                  | 0.000                  | 0                   | 1                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 50    | U                       | NHH                      | 5                          | 0.050                  | 0.000                  | 0.000                  | 1                   | 3                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 120   | U                       | NHH                      | 35                         | 0.382                  | 0.000                  | 0.000                  | 4                   | 10                |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 175   | U                       | NHH                      | 15                         | 0.162                  | 0.000                  | 0.000                  | 1                   | 2                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 250   | U                       | NHH                      | 17                         | 0.185                  | 0.000                  | 0.000                  | 1                   | 2                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 500   | U                       | NHH                      | 62                         | 0.683                  | 0.000                  | 0.000                  | 2                   | 4                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 750   | U                       | NHH                      | 69                         | 0.764                  | 0.000                  | 0.000                  | 1                   | 2                 |
| Construction and Mining Equipment | Bore/Drill Rigs   | D           | 1000  | U                       | NHH                      | 175                        | 1.931                  | 0.000                  | 0.000                  | 2                   | 4                 |

| Class of Equipment                | Equipment                | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|--------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                          | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4             | 5     | U                          | NHH                         | 6                        | 0.032                     | 0.000                     | 0.000                     | 90                     | 23                   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4             | 15    | U                          | NHH                         | 18                       | 0.086                     | 0.000                     | 0.000                     | 153                    | 39                   |
| Construction and Mining Equipment | Cement and Mortar Mixers | G4             | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Construction and Mining Equipment | Cement and Mortar Mixers | D              | 15    | U                          | NHH                         | 1                        | 0.014                     | 0.000                     | 0.000                     | 5                      | 5                    |
| Construction and Mining Equipment | Cement and Mortar Mixers | D              | 25    | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 5     | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 5                      | 2                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 15    | U                          | NHH                         | 13                       | 0.063                     | 0.000                     | 0.000                     | 22                     | 19                   |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 25    | U                          | NHH                         | 8                        | 0.037                     | 0.000                     | 0.000                     | 7                      | 6                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 50    | U                          | NHH                         | 2                        | 0.021                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | G4             | 120   | U                          | NHH                         | 2                        | 0.022                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 50    | U                          | NHH                         | 1                        | 0.009                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 120   | U                          | NHH                         | 4                        | 0.039                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Concrete/Industrial Saws | D              | 175   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Cranes                   | G4             | 50    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Cranes                   | G4             | 120   | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Cranes                   | G4             | 175   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Cranes                   | D              | 50    | U                          | NHH                         | 1                        | 0.015                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Cranes                   | D              | 120   | U                          | NHH                         | 32                       | 0.352                     | 0.000                     | 0.000                     | 4                      | 14                   |
| Construction and Mining Equipment | Cranes                   | D              | 175   | U                          | NHH                         | 51                       | 0.564                     | 0.000                     | 0.000                     | 4                      | 14                   |
| Construction and Mining Equipment | Cranes                   | D              | 250   | U                          | NHH                         | 138                      | 1.527                     | 0.000                     | 0.000                     | 8                      | 27                   |
| Construction and Mining Equipment | Cranes                   | D              | 500   | U                          | NHH                         | 81                       | 0.898                     | 0.000                     | 0.000                     | 3                      | 10                   |
| Construction and Mining Equipment | Cranes                   | D              | 750   | U                          | NHH                         | 109                      | 1.205                     | 0.000                     | 0.000                     | 2                      | 8                    |
| Construction and Mining Equipment | Cranes                   | D              | 9999  | U                          | NHH                         | 438                      | 4.844                     | 0.000                     | 0.000                     | 3                      | 10                   |
| Construction and Mining Equipment | Crawler Tractors         | D              | 50    | U                          | NHH                         | 0                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crawler Tractors         | D              | 120   | U                          | NHH                         | 723                      | 7.924                     | 0.000                     | 0.000                     | 85                     | 241                  |
| Construction and Mining Equipment | Crawler Tractors         | D              | 175   | U                          | NHH                         | 450                      | 4.938                     | 0.000                     | 0.000                     | 29                     | 82                   |
| Construction and Mining Equipment | Crawler Tractors         | D              | 250   | U                          | NHH                         | 526                      | 5.817                     | 0.000                     | 0.000                     | 25                     | 70                   |
| Construction and Mining Equipment | Crawler Tractors         | D              | 500   | U                          | NHH                         | 563                      | 6.221                     | 0.000                     | 0.000                     | 17                     | 48                   |
| Construction and Mining Equipment | Crawler Tractors         | D              | 750   | U                          | NHH                         | 55                       | 0.610                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Crawler Tractors         | D              | 1000  | U                          | NHH                         | 78                       | 0.864                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4             | 15    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4             | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | G4             | 120   | U                          | NHH                         | 1                        | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 50    | U                          | NHH                         | 9                        | 0.099                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 120   | U                          | NHH                         | 48                       | 0.528                     | 0.000                     | 0.000                     | 5                      | 13                   |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 175   | U                          | NHH                         | 41                       | 0.450                     | 0.000                     | 0.000                     | 2                      | 5                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 250   | U                          | NHH                         | 6                        | 0.065                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 500   | U                          | NHH                         | 51                       | 0.563                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 750   | U                          | NHH                         | 4                        | 0.045                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Crushing/Proc. Equipment | D              | 9999  | U                          | NHH                         | 9                        | 0.100                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4             | 5     | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 5                      | 2                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4             | 15    | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 10                     | 4                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4             | 25    | U                          | NHH                         | 1                        | 0.003                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Dumpers/Tenders          | G4             | 120   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Dumpers/Tenders          | D              | 25    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Excavators               | D              | 25    | U                          | NHH                         | 1                        | 0.013                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Construction and Mining Equipment | Excavators               | D              | 50    | U                          | NHH                         | 66                       | 0.723                     | 0.000                     | 0.000                     | 15                     | 58                   |
| Construction and Mining Equipment | Excavators               | D              | 120   | U                          | NHH                         | 527                      | 5.782                     | 0.000                     | 0.000                     | 41                     | 157                  |
| Construction and Mining Equipment | Excavators               | D              | 175   | U                          | NHH                         | 1,547                    | 17.001                    | 0.001                     | 0.000                     | 79                     | 303                  |
| Construction and Mining Equipment | Excavators               | D              | 250   | U                          | NHH                         | 884                      | 9.777                     | 0.000                     | 0.000                     | 32                     | 123                  |
| Construction and Mining Equipment | Excavators               | D              | 500   | U                          | NHH                         | 940                      | 10.388                    | 0.000                     | 0.000                     | 23                     | 89                   |
| Construction and Mining Equipment | Excavators               | D              | 750   | U                          | NHH                         | 37                       | 0.409                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Graders                  | D              | 50    | U                          | NHH                         | 0                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |



| Class of Equipment                | Equipment                    | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|------------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                              | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Graders                      | D              | 120   | U                          | NHH                         | 88                       | 0.969                     | 0.000                     | 0.000                     | 10                     | 26                   |
| Construction and Mining Equipment | Graders                      | D              | 175   | U                          | NHH                         | 498                      | 5.470                     | 0.000                     | 0.000                     | 34                     | 88                   |
| Construction and Mining Equipment | Graders                      | D              | 250   | U                          | NHH                         | 426                      | 4.714                     | 0.000                     | 0.000                     | 21                     | 55                   |
| Construction and Mining Equipment | Graders                      | D              | 500   | U                          | NHH                         | 16                       | 0.178                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Graders                      | D              | 750   | U                          | NHH                         | 2                        | 0.022                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Off-Highway Tractors         | D              | 120   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Off-Highway Tractors         | D              | 175   | U                          | NHH                         | 236                      | 2.593                     | 0.000                     | 0.000                     | 13                     | 40                   |
| Construction and Mining Equipment | Off-Highway Tractors         | D              | 250   | U                          | NHH                         | 222                      | 2.451                     | 0.000                     | 0.000                     | 12                     | 38                   |
| Construction and Mining Equipment | Off-Highway Tractors         | D              | 750   | U                          | NHH                         | 455                      | 5.022                     | 0.000                     | 0.000                     | 6                      | 18                   |
| Construction and Mining Equipment | Off-Highway Tractors         | D              | 1000  | U                          | NHH                         | 69                       | 0.759                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Off-Highway Trucks           | D              | 175   | U                          | NHH                         | 22                       | 0.236                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Construction and Mining Equipment | Off-Highway Trucks           | D              | 250   | U                          | NHH                         | 210                      | 2.324                     | 0.000                     | 0.000                     | 5                      | 28                   |
| Construction and Mining Equipment | Off-Highway Trucks           | D              | 500   | U                          | NHH                         | 484                      | 5.352                     | 0.000                     | 0.000                     | 7                      | 39                   |
| Construction and Mining Equipment | Off-Highway Trucks           | D              | 750   | U                          | NHH                         | 792                      | 8.750                     | 0.000                     | 0.000                     | 7                      | 40                   |
| Construction and Mining Equipment | Off-Highway Trucks           | D              | 1000  | U                          | NHH                         | 524                      | 5.798                     | 0.000                     | 0.000                     | 3                      | 19                   |
| Construction and Mining Equipment | Other Construction Equipment | G4             | 175   | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Other Construction Equipment | D              | 15    | U                          | NHH                         | 3                        | 0.034                     | 0.000                     | 0.000                     | 4                      | 7                    |
| Construction and Mining Equipment | Other Construction Equipment | D              | 25    | U                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Other Construction Equipment | D              | 50    | U                          | NHH                         | 2                        | 0.025                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Other Construction Equipment | D              | 120   | U                          | NHH                         | 11                       | 0.118                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Construction and Mining Equipment | Other Construction Equipment | D              | 175   | U                          | NHH                         | 19                       | 0.214                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Other Construction Equipment | D              | 500   | U                          | NHH                         | 107                      | 1.188                     | 0.000                     | 0.000                     | 5                      | 9                    |
| Construction and Mining Equipment | Pavers                       | D              | 25    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Pavers                       | D              | 50    | U                          | NHH                         | 27                       | 0.297                     | 0.000                     | 0.000                     | 9                      | 21                   |
| Construction and Mining Equipment | Pavers                       | D              | 120   | U                          | NHH                         | 79                       | 0.867                     | 0.000                     | 0.000                     | 11                     | 25                   |
| Construction and Mining Equipment | Pavers                       | D              | 175   | U                          | NHH                         | 91                       | 0.999                     | 0.000                     | 0.000                     | 7                      | 16                   |
| Construction and Mining Equipment | Pavers                       | D              | 250   | U                          | NHH                         | 16                       | 0.182                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Pavers                       | D              | 500   | U                          | NHH                         | 20                       | 0.224                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Construction and Mining Equipment | Paving Equipment             | G4             | 5     | U                          | NHH                         | 6                        | 0.033                     | 0.000                     | 0.000                     | 64                     | 30                   |
| Construction and Mining Equipment | Paving Equipment             | G4             | 15    | U                          | NHH                         | 34                       | 0.165                     | 0.000                     | 0.000                     | 108                    | 59                   |
| Construction and Mining Equipment | Paving Equipment             | G4             | 25    | U                          | NHH                         | 2                        | 0.008                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | G4             | 50    | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | G4             | 120   | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Paving Equipment             | D              | 25    | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | D              | 50    | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Paving Equipment             | D              | 120   | U                          | NHH                         | 19                       | 0.212                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Construction and Mining Equipment | Paving Equipment             | D              | 175   | U                          | NHH                         | 17                       | 0.185                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Paving Equipment             | D              | 250   | U                          | NHH                         | 6                        | 0.063                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Plate Compactors             | G2             | 15    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Construction and Mining Equipment | Plate Compactors             | G4             | 5     | U                          | NHH                         | 4                        | 0.023                     | 0.000                     | 0.000                     | 46                     | 22                   |
| Construction and Mining Equipment | Plate Compactors             | G4             | 15    | U                          | NHH                         | 12                       | 0.057                     | 0.000                     | 0.000                     | 48                     | 27                   |
| Construction and Mining Equipment | Plate Compactors             | D              | 15    | U                          | NHH                         | 1                        | 0.012                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Construction and Mining Equipment | Rollers                      | G4             | 5     | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 5                      | 1                    |
| Construction and Mining Equipment | Rollers                      | G4             | 15    | U                          | NHH                         | 4                        | 0.018                     | 0.000                     | 0.000                     | 8                      | 7                    |
| Construction and Mining Equipment | Rollers                      | G4             | 25    | U                          | NHH                         | 6                        | 0.026                     | 0.000                     | 0.000                     | 6                      | 5                    |
| Construction and Mining Equipment | Rollers                      | G4             | 50    | U                          | NHH                         | 2                        | 0.011                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rollers                      | G4             | 120   | U                          | NHH                         | 5                        | 0.041                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rollers                      | D              | 15    | U                          | NHH                         | 4                        | 0.039                     | 0.000                     | 0.000                     | 7                      | 12                   |
| Construction and Mining Equipment | Rollers                      | D              | 25    | U                          | NHH                         | 3                        | 0.035                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Construction and Mining Equipment | Rollers                      | D              | 50    | U                          | NHH                         | 19                       | 0.210                     | 0.000                     | 0.000                     | 8                      | 16                   |
| Construction and Mining Equipment | Rollers                      | D              | 120   | U                          | NHH                         | 234                      | 2.564                     | 0.000                     | 0.000                     | 45                     | 87                   |
| Construction and Mining Equipment | Rollers                      | D              | 175   | U                          | NHH                         | 172                      | 1.890                     | 0.000                     | 0.000                     | 18                     | 35                   |
| Construction and Mining Equipment | Rollers                      | D              | 250   | U                          | NHH                         | 34                       | 0.380                     | 0.000                     | 0.000                     | 3                      | 5                    |
| Construction and Mining Equipment | Rollers                      | D              | 500   | U                          | NHH                         | 34                       | 0.381                     | 0.000                     | 0.000                     | 2                      | 3                    |

| Class of Equipment                | Equipment                 | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|---------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                           | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Rough Terrain Forklifts   | G4             | 50    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts   | G4             | 120   | U                          | NHH                         | 5                        | 0.047                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rough Terrain Forklifts   | G4             | 175   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rough Terrain Forklifts   | D              | 50    | U                          | NHH                         | 6                        | 0.062                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Construction and Mining Equipment | Rough Terrain Forklifts   | D              | 120   | U                          | NHH                         | 503                      | 5.521                     | 0.000                     | 0.000                     | 57                     | 177                  |
| Construction and Mining Equipment | Rough Terrain Forklifts   | D              | 175   | U                          | NHH                         | 129                      | 1.414                     | 0.000                     | 0.000                     | 7                      | 23                   |
| Construction and Mining Equipment | Rough Terrain Forklifts   | D              | 250   | U                          | NHH                         | 10                       | 0.108                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rough Terrain Forklifts   | D              | 500   | U                          | NHH                         | 10                       | 0.107                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Rubber Tired Dozers       | D              | 175   | U                          | NHH                         | 3                        | 0.031                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Dozers       | D              | 250   | U                          | NHH                         | 96                       | 1.065                     | 0.000                     | 0.000                     | 3                      | 12                   |
| Construction and Mining Equipment | Rubber Tired Dozers       | D              | 500   | U                          | NHH                         | 214                      | 2.366                     | 0.000                     | 0.000                     | 4                      | 18                   |
| Construction and Mining Equipment | Rubber Tired Dozers       | D              | 750   | U                          | NHH                         | 123                      | 1.361                     | 0.000                     | 0.000                     | 2                      | 7                    |
| Construction and Mining Equipment | Rubber Tired Dozers       | D              | 1000  | U                          | NHH                         | 12                       | 0.137                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Loaders      | G4             | 50    | U                          | NHH                         | 1                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Loaders      | G4             | 120   | U                          | NHH                         | 6                        | 0.049                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 25    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 50    | U                          | NHH                         | 11                       | 0.120                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 120   | U                          | NHH                         | 565                      | 6.196                     | 0.000                     | 0.000                     | 80                     | 211                  |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 175   | U                          | NHH                         | 573                      | 6.302                     | 0.000                     | 0.000                     | 45                     | 119                  |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 250   | U                          | NHH                         | 794                      | 8.782                     | 0.000                     | 0.000                     | 45                     | 118                  |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 500   | U                          | NHH                         | 526                      | 5.814                     | 0.000                     | 0.000                     | 19                     | 49                   |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 750   | U                          | NHH                         | 82                       | 0.905                     | 0.000                     | 0.000                     | 1                      | 4                    |
| Construction and Mining Equipment | Rubber Tired Loaders      | D              | 1000  | U                          | NHH                         | 11                       | 0.119                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Scrapers                  | D              | 120   | U                          | NHH                         | 5                        | 0.059                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Scrapers                  | D              | 175   | U                          | NHH                         | 78                       | 0.858                     | 0.000                     | 0.000                     | 4                      | 12                   |
| Construction and Mining Equipment | Scrapers                  | D              | 250   | U                          | NHH                         | 107                      | 1.183                     | 0.000                     | 0.000                     | 4                      | 11                   |
| Construction and Mining Equipment | Scrapers                  | D              | 500   | U                          | NHH                         | 452                      | 4.997                     | 0.000                     | 0.000                     | 10                     | 31                   |
| Construction and Mining Equipment | Scrapers                  | D              | 750   | U                          | NHH                         | 139                      | 1.532                     | 0.000                     | 0.000                     | 2                      | 6                    |
| Construction and Mining Equipment | Signal Boards             | G4             | 5     | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Signal Boards             | G4             | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Signal Boards             | D              | 15    | U                          | NHH                         | 18                       | 0.192                     | 0.000                     | 0.000                     | 30                     | 62                   |
| Construction and Mining Equipment | Signal Boards             | D              | 50    | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Signal Boards             | D              | 120   | U                          | NHH                         | 13                       | 0.145                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Construction and Mining Equipment | Signal Boards             | D              | 175   | U                          | NHH                         | 16                       | 0.173                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Construction and Mining Equipment | Signal Boards             | D              | 250   | U                          | NHH                         | 5                        | 0.060                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Skid Steer Loaders        | G4             | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Skid Steer Loaders        | G4             | 25    | U                          | NHH                         | 32                       | 0.148                     | 0.000                     | 0.000                     | 32                     | 28                   |
| Construction and Mining Equipment | Skid Steer Loaders        | G4             | 50    | U                          | NHH                         | 7                        | 0.059                     | 0.000                     | 0.000                     | 4                      | 4                    |
| Construction and Mining Equipment | Skid Steer Loaders        | G4             | 120   | U                          | NHH                         | 9                        | 0.088                     | 0.000                     | 0.000                     | 3                      | 2                    |
| Construction and Mining Equipment | Skid Steer Loaders        | D              | 25    | U                          | NHH                         | 30                       | 0.326                     | 0.000                     | 0.000                     | 21                     | 47                   |
| Construction and Mining Equipment | Skid Steer Loaders        | D              | 50    | U                          | NHH                         | 506                      | 5.540                     | 0.000                     | 0.000                     | 187                    | 435                  |
| Construction and Mining Equipment | Skid Steer Loaders        | D              | 120   | U                          | NHH                         | 443                      | 4.864                     | 0.000                     | 0.000                     | 98                     | 228                  |
| Construction and Mining Equipment | Surfacing Equipment       | G4             | 5     | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 12                     | 6                    |
| Construction and Mining Equipment | Surfacing Equipment       | G4             | 15    | U                          | NHH                         | 19                       | 0.089                     | 0.000                     | 0.000                     | 35                     | 48                   |
| Construction and Mining Equipment | Surfacing Equipment       | G4             | 25    | U                          | NHH                         | 1                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 50    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 120   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 175   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 250   | U                          | NHH                         | 0                        | 0.005                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 500   | U                          | NHH                         | 7                        | 0.073                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Surfacing Equipment       | D              | 750   | U                          | NHH                         | 7                        | 0.075                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Construction and Mining Equipment | Tampers/Rammers           | G2             | 15    | U                          | NHH                         | 3                        | 0.014                     | 0.000                     | 0.000                     | 27                     | 13                   |
| Construction and Mining Equipment | Tampers/Rammers           | G4             | 15    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | G4             | 120   | U                          | NHH                         | 4                        | 0.035                     | 0.000                     | 0.000                     | 1                      | 1                    |



| Class of Equipment                | Equipment                 | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-----------------------------------|---------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                                   |                           | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 25    | U                          | NHH                         | 6                        | 0.062                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 50    | U                          | NHH                         | 66                       | 0.718                     | 0.000                     | 0.000                     | 18                     | 47                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 120   | U                          | NHH                         | 1,493                    | 16.380                    | 0.001                     | 0.000                     | 243                    | 634                  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 175   | U                          | NHH                         | 218                      | 2.396                     | 0.000                     | 0.000                     | 18                     | 47                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 250   | U                          | NHH                         | 119                      | 1.313                     | 0.000                     | 0.000                     | 6                      | 15                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 500   | U                          | NHH                         | 385                      | 4.254                     | 0.000                     | 0.000                     | 9                      | 25                   |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes | D              | 750   | U                          | NHH                         | 431                      | 4.762                     | 0.000                     | 0.000                     | 7                      | 18                   |
| Construction and Mining Equipment | Trenchers                 | G4             | 15    | U                          | NHH                         | 7                        | 0.035                     | 0.000                     | 0.000                     | 10                     | 11                   |
| Construction and Mining Equipment | Trenchers                 | G4             | 25    | U                          | NHH                         | 12                       | 0.057                     | 0.000                     | 0.000                     | 7                      | 9                    |
| Construction and Mining Equipment | Trenchers                 | G4             | 50    | U                          | NHH                         | 7                        | 0.055                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Construction and Mining Equipment | Trenchers                 | G4             | 120   | U                          | NHH                         | 4                        | 0.040                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 15    | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 25    | U                          | NHH                         | 2                        | 0.024                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 50    | U                          | NHH                         | 84                       | 0.910                     | 0.000                     | 0.000                     | 32                     | 55                   |
| Construction and Mining Equipment | Trenchers                 | D              | 120   | U                          | NHH                         | 222                      | 2.431                     | 0.000                     | 0.000                     | 44                     | 75                   |
| Construction and Mining Equipment | Trenchers                 | D              | 175   | U                          | NHH                         | 54                       | 0.590                     | 0.000                     | 0.000                     | 5                      | 8                    |
| Construction and Mining Equipment | Trenchers                 | D              | 250   | U                          | NHH                         | 7                        | 0.082                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 500   | U                          | NHH                         | 13                       | 0.146                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Construction and Mining Equipment | Trenchers                 | D              | 750   | U                          | NHH                         | 3                        | 0.035                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 500   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Compressor (Dredging)     | D              | 1000  | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Crane (Dredging)          | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Deck/door engine          | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Dredger                   | D              | 9999  | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 500   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Generator (Dredging)      | D              | 9999  | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D              | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D              | 500   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Hoist/swing/winch         | D              | 9999  | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Other (Dredging)          | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Other (Dredging)          | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Other (Dredging)          | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Other (Dredging)          | D              | 500   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Pump (Dredging)           | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Pump (Dredging)           | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Pump (Dredging)           | D              | 250   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Pump (Dredging)           | D              | 500   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Dredging                          | Pump (Dredging)           | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |

| Class of Equipment      | Equipment                         | Engine      | MaxHP | Commercial or           |                          | Fuel | CO2 Exhaust | CH4 Exhaust | N2O Exhaust | Number of | Activity |
|-------------------------|-----------------------------------|-------------|-------|-------------------------|--------------------------|------|-------------|-------------|-------------|-----------|----------|
|                         |                                   | Type & Fuel |       | Residential Application | Handheld or Non-handheld |      |             |             |             |           |          |
| Dredging                | Pump (Dredging)                   | D           | 9999  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Entertainment Equipment | Compressor (Entertainment)        | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Entertainment Equipment | Generator (Entertainment)         | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Entertainment Equipment | Generator (Entertainment)         | D           | 120   | U                       | NHH                      | 2    | 0.024       | 0.000       | 0.000       | 1         | 1        |
| Entertainment Equipment | Generator (Entertainment)         | D           | 175   | U                       | NHH                      | 3    | 0.033       | 0.000       | 0.000       | 0         | 0        |
| Entertainment Equipment | Generator (Entertainment)         | D           | 250   | U                       | NHH                      | 6    | 0.068       | 0.000       | 0.000       | 1         | 1        |
| Entertainment Equipment | Generator (Entertainment)         | D           | 500   | U                       | NHH                      | 13   | 0.148       | 0.000       | 0.000       | 1         | 1        |
| Entertainment Equipment | Generator (Entertainment)         | D           | 750   | U                       | NHH                      | 5    | 0.051       | 0.000       | 0.000       | 0         | 0        |
| Entertainment Equipment | Generator (Entertainment)         | D           | 9999  | U                       | NHH                      | 1    | 0.013       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Aerial Lifts                      | G4          | 15    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Aerial Lifts                      | G4          | 25    | U                       | NHH                      | 2    | 0.010       | 0.000       | 0.000       | 2         | 3        |
| Industrial Equipment    | Aerial Lifts                      | G4          | 50    | U                       | NHH                      | 5    | 0.039       | 0.000       | 0.000       | 3         | 3        |
| Industrial Equipment    | Aerial Lifts                      | G4          | 120   | U                       | NHH                      | 8    | 0.078       | 0.000       | 0.000       | 3         | 3        |
| Industrial Equipment    | Aerial Lifts                      | C4          | 15    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Aerial Lifts                      | C4          | 25    | U                       | NHH                      | 3    | 0.018       | 0.000       | 0.000       | 3         | 3        |
| Industrial Equipment    | Aerial Lifts                      | D           | 15    | U                       | NHH                      | 1    | 0.007       | 0.000       | 0.000       | 1         | 2        |
| Industrial Equipment    | Aerial Lifts                      | D           | 25    | U                       | NHH                      | 1    | 0.014       | 0.000       | 0.000       | 2         | 2        |
| Industrial Equipment    | Aerial Lifts                      | D           | 50    | U                       | NHH                      | 8    | 0.086       | 0.000       | 0.000       | 8         | 9        |
| Industrial Equipment    | Aerial Lifts                      | D           | 120   | U                       | NHH                      | 13   | 0.148       | 0.000       | 0.000       | 7         | 8        |
| Industrial Equipment    | Aerial Lifts                      | D           | 500   | U                       | NHH                      | 10   | 0.106       | 0.000       | 0.000       | 1         | 1        |
| Industrial Equipment    | Aerial Lifts                      | D           | 750   | U                       | NHH                      | 1    | 0.015       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Forklifts                         | G4          | 25    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Forklifts                         | G4          | 50    | U                       | NHH                      | 79   | 0.524       | 0.000       | 0.000       | 10        | 49       |
| Industrial Equipment    | Forklifts                         | G4          | 120   | U                       | NHH                      | 365  | 3.106       | 0.000       | 0.001       | 35        | 173      |
| Industrial Equipment    | Forklifts                         | G4          | 175   | U                       | NHH                      | 26   | 0.230       | 0.000       | 0.000       | 1         | 6        |
| Industrial Equipment    | Forklifts                         | C4          | 25    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Forklifts                         | C4          | 50    | U                       | NHH                      | 121  | 0.828       | 0.001       | 0.000       | 18        | 91       |
| Industrial Equipment    | Forklifts                         | C4          | 120   | U                       | NHH                      | 756  | 4.962       | 0.004       | 0.000       | 64        | 318      |
| Industrial Equipment    | Forklifts                         | C4          | 175   | U                       | NHH                      | 57   | 0.379       | 0.000       | 0.000       | 2         | 12       |
| Industrial Equipment    | Forklifts                         | D           | 50    | U                       | NHH                      | 8    | 0.091       | 0.000       | 0.000       | 3         | 12       |
| Industrial Equipment    | Forklifts                         | D           | 120   | U                       | NHH                      | 28   | 0.304       | 0.000       | 0.000       | 4         | 20       |
| Industrial Equipment    | Forklifts                         | D           | 175   | U                       | NHH                      | 50   | 0.549       | 0.000       | 0.000       | 4         | 20       |
| Industrial Equipment    | Forklifts                         | D           | 250   | U                       | NHH                      | 68   | 0.750       | 0.000       | 0.000       | 4         | 19       |
| Industrial Equipment    | Forklifts                         | D           | 500   | U                       | NHH                      | 42   | 0.462       | 0.000       | 0.000       | 2         | 8        |
| Industrial Equipment    | Other General Industrial Equipmen | G2          | 15    | U                       | NHH                      | 0    | 0.001       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Other General Industrial Equipmen | G4          | 15    | U                       | NHH                      | 1    | 0.007       | 0.000       | 0.000       | 3         | 3        |
| Industrial Equipment    | Other General Industrial Equipmen | G4          | 25    | U                       | NHH                      | 1    | 0.006       | 0.000       | 0.000       | 1         | 1        |
| Industrial Equipment    | Other General Industrial Equipmen | G4          | 50    | U                       | NHH                      | 3    | 0.026       | 0.000       | 0.000       | 1         | 2        |
| Industrial Equipment    | Other General Industrial Equipmen | G4          | 120   | U                       | NHH                      | 2    | 0.022       | 0.000       | 0.000       | 0         | 1        |
| Industrial Equipment    | Other General Industrial Equipmen | G4          | 175   | U                       | NHH                      | 1    | 0.005       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 15    | U                       | NHH                      | 1    | 0.006       | 0.000       | 0.000       | 0         | 2        |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 25    | U                       | NHH                      | 2    | 0.019       | 0.000       | 0.000       | 1         | 3        |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 50    | U                       | NHH                      | 3    | 0.034       | 0.000       | 0.000       | 1         | 3        |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 120   | U                       | NHH                      | 36   | 0.390       | 0.000       | 0.000       | 3         | 13       |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 175   | U                       | NHH                      | 55   | 0.606       | 0.000       | 0.000       | 3         | 13       |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 250   | U                       | NHH                      | 77   | 0.852       | 0.000       | 0.000       | 3         | 13       |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 500   | U                       | NHH                      | 151  | 1.665       | 0.000       | 0.000       | 3         | 13       |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 750   | U                       | NHH                      | 62   | 0.685       | 0.000       | 0.000       | 1         | 3        |
| Industrial Equipment    | Other General Industrial Equipmen | D           | 1000  | U                       | NHH                      | 48   | 0.533       | 0.000       | 0.000       | 0         | 2        |
| Industrial Equipment    | Other Material Handling Equipment | G4          | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Other Material Handling Equipment | G4          | 120   | U                       | NHH                      | 2    | 0.015       | 0.000       | 0.000       | 1         | 1        |
| Industrial Equipment    | Other Material Handling Equipment | D           | 50    | U                       | NHH                      | 0    | 0.001       | 0.000       | 0.000       | 0         | 0        |
| Industrial Equipment    | Other Material Handling Equipment | D           | 120   | U                       | NHH                      | 1    | 0.015       | 0.000       | 0.000       | 0         | 1        |
| Industrial Equipment    | Other Material Handling Equipment | D           | 175   | U                       | NHH                      | 3    | 0.033       | 0.000       | 0.000       | 0         | 1        |

| Class of Equipment        | Equipment                         | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|---------------------------|-----------------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                           |                                   | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Industrial Equipment      | Other Material Handling Equipment | D              | 250   | U                          | NHH                         | 8                        | 0.093                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 500   | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Other Material Handling Equipment | D              | 9999  | U                          | NHH                         | 2                        | 0.027                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 15    | U                          | NHH                         | 1                        | 0.003                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 25    | U                          | NHH                         | 2                        | 0.007                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 50    | U                          | NHH                         | 10                       | 0.085                     | 0.000                     | 0.000                     | 3                      | 4                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 120   | U                          | NHH                         | 15                       | 0.136                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Industrial Equipment      | Sweepers/Scrubbers                | G4             | 175   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 25    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 50    | U                          | NHH                         | 17                       | 0.190                     | 0.000                     | 0.000                     | 4                      | 12                   |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 120   | U                          | NHH                         | 68                       | 0.748                     | 0.000                     | 0.000                     | 6                      | 20                   |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 175   | U                          | NHH                         | 58                       | 0.638                     | 0.000                     | 0.000                     | 3                      | 9                    |
| Industrial Equipment      | Sweepers/Scrubbers                | D              | 250   | U                          | NHH                         | 11                       | 0.119                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 2     | C                          | HH                          | 19                       | 0.078                     | 0.001                     | 0.000                     | 404                    | 320                  |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 2     | R                          | HH                          | 3                        | 0.015                     | 0.000                     | 0.000                     | 4,545                  | 61                   |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 15    | C                          | HH                          | 33                       | 0.133                     | 0.002                     | 0.000                     | 285                    | 226                  |
| Lawn and Garden Equipment | Chainsaws                         | G2             | 15    | R                          | HH                          | 5                        | 0.025                     | 0.000                     | 0.000                     | 3,201                  | 43                   |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2             | 15    | C                          | HH                          | 40                       | 0.165                     | 0.002                     | 0.000                     | 354                    | 281                  |
| Lawn and Garden Equipment | Chainsaws Preempt                 | G2             | 15    | R                          | HH                          | 6                        | 0.032                     | 0.000                     | 0.000                     | 3,985                  | 53                   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 15    | C                          | NHH                         | 2                        | 0.009                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 15    | R                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 25    | C                          | NHH                         | 18                       | 0.083                     | 0.000                     | 0.000                     | 4                      | 12                   |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | G4             | 25    | R                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 6                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 120   | U                          | NHH                         | 6                        | 0.068                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 175   | U                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 250   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 500   | U                          | NHH                         | 3                        | 0.033                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 750   | U                          | NHH                         | 8                        | 0.090                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Chippers/Stump Grinders           | D              | 1000  | U                          | NHH                         | 22                       | 0.244                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Lawn and Garden Equipment | Commercial Turf Equipment         | G2             | 15    | C                          | NHH                         | 5                        | 0.025                     | 0.000                     | 0.000                     | 5                      | 12                   |
| Lawn and Garden Equipment | Commercial Turf Equipment         | G2             | 25    | C                          | NHH                         | 5                        | 0.026                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Lawn and Garden Equipment | Commercial Turf Equipment         | G4             | 15    | C                          | NHH                         | 56                       | 0.271                     | 0.000                     | 0.000                     | 47                     | 104                  |
| Lawn and Garden Equipment | Commercial Turf Equipment         | G4             | 25    | C                          | NHH                         | 49                       | 0.230                     | 0.000                     | 0.000                     | 23                     | 51                   |
| Lawn and Garden Equipment | Commercial Turf Equipment         | G4             | 50    | U                          | NHH                         | 32                       | 0.229                     | 0.000                     | 0.000                     | 9                      | 19                   |
| Lawn and Garden Equipment | Commercial Turf Equipment         | G4             | 120   | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Lawn and Garden Equipment | Commercial Turf Equipment         | D              | 15    | U                          | NHH                         | 4                        | 0.039                     | 0.000                     | 0.000                     | 3                      | 8                    |
| Lawn and Garden Equipment | Commercial Turf Equipment         | D              | 25    | U                          | NHH                         | 100                      | 1.096                     | 0.000                     | 0.000                     | 52                     | 151                  |
| Lawn and Garden Equipment | Front Mowers                      | G4             | 15    | C                          | NHH                         | 13                       | 0.064                     | 0.000                     | 0.000                     | 34                     | 25                   |
| Lawn and Garden Equipment | Front Mowers                      | G4             | 15    | R                          | NHH                         | 44                       | 0.216                     | 0.000                     | 0.000                     | 1,084                  | 84                   |
| Lawn and Garden Equipment | Front Mowers                      | G4             | 25    | C                          | NHH                         | 14                       | 0.066                     | 0.000                     | 0.000                     | 26                     | 20                   |
| Lawn and Garden Equipment | Front Mowers                      | G4             | 25    | R                          | NHH                         | 47                       | 0.222                     | 0.000                     | 0.000                     | 849                    | 66                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors            | G4             | 15    | C                          | NHH                         | 30                       | 0.148                     | 0.000                     | 0.000                     | 134                    | 47                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors            | G4             | 15    | R                          | NHH                         | 22                       | 0.109                     | 0.000                     | 0.000                     | 871                    | 35                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors            | G4             | 25    | C                          | NHH                         | 19                       | 0.090                     | 0.000                     | 0.000                     | 53                     | 19                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors            | G4             | 25    | R                          | NHH                         | 14                       | 0.066                     | 0.000                     | 0.000                     | 344                    | 14                   |
| Lawn and Garden Equipment | Lawn & Garden Tractors            | G4             | 50    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Lawn and Garden Equipment | Lawn & Garden Tractors            | D              | 15    | U                          | NHH                         | 69                       | 0.757                     | 0.000                     | 0.000                     | 109                    | 163                  |
| Lawn and Garden Equipment | Lawn & Garden Tractors            | D              | 25    | U                          | NHH                         | 83                       | 0.911                     | 0.000                     | 0.000                     | 86                     | 128                  |
| Lawn and Garden Equipment | Lawn Mowers                       | G2             | 15    | C                          | NHH                         | 16                       | 0.096                     | 0.000                     | 0.000                     | 226                    | 141                  |
| Lawn and Garden Equipment | Lawn Mowers                       | G2             | 15    | R                          | NHH                         | 9                        | 0.049                     | 0.000                     | 0.000                     | 1,694                  | 72                   |
| Lawn and Garden Equipment | Lawn Mowers                       | G4             | 5     | C                          | NHH                         | 101                      | 0.570                     | 0.001                     | 0.001                     | 1,336                  | 836                  |
| Lawn and Garden Equipment | Lawn Mowers                       | G4             | 5     | R                          | NHH                         | 120                      | 0.613                     | 0.001                     | 0.001                     | 21,175                 | 899                  |

| Class of Equipment         | Equipment                     | Engine      | MaxHP | Commercial or           |                          | Fuel Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) | Number of Equipment | Activity (hr/day) |
|----------------------------|-------------------------------|-------------|-------|-------------------------|--------------------------|----------------------------|------------------------|------------------------|------------------------|---------------------|-------------------|
|                            |                               | Type & Fuel |       | Residential Application | Handheld or Non-handheld |                            |                        |                        |                        |                     |                   |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums          | G2          | 2     | C                       | HH                       | 56                         | 0.250                  | 0.002                  | 0.000                  | 1,967               | 1,058             |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums          | G2          | 2     | R                       | HH                       | 3                          | 0.016                  | 0.000                  | 0.000                  | 5,071               | 67                |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums          | G4          | 5     | C                       | NHH                      | 1                          | 0.004                  | 0.000                  | 0.000                  | 62                  | 11                |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums          | G4          | 5     | R                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 53                  | 1                 |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums          | D           | 15    | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums          | D           | 120   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums          | D           | 250   | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G2          | 2     | C                       | HH                       | 0                          | 0.000                  | 0.000                  | 0.000                  | 2                   | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G2          | 2     | R                       | HH                       | 0                          | 0.000                  | 0.000                  | 0.000                  | 68                  | 1                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G2          | 15    | C                       | HH                       | 0                          | 0.000                  | 0.000                  | 0.000                  | 1                   | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G2          | 15    | R                       | HH                       | 0                          | 0.000                  | 0.000                  | 0.000                  | 30                  | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 5     | C                       | NHH                      | 2                          | 0.009                  | 0.000                  | 0.000                  | 42                  | 8                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 5     | R                       | NHH                      | 3                          | 0.017                  | 0.000                  | 0.000                  | 1,278               | 15                |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 15    | C                       | NHH                      | 2                          | 0.008                  | 0.000                  | 0.000                  | 19                  | 3                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 15    | R                       | NHH                      | 3                          | 0.015                  | 0.000                  | 0.000                  | 567                 | 7                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 25    | C                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 25    | R                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 12                  | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 50    | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | G4          | 120   | U                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | D           | 15    | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment | D           | 25    | U                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4          | 15    | C                       | NHH                      | 181                        | 0.880                  | 0.000                  | 0.001                  | 731                 | 544               |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4          | 15    | R                       | NHH                      | 16                         | 0.080                  | 0.000                  | 0.000                  | 641                 | 50                |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4          | 25    | C                       | NHH                      | 2                          | 0.008                  | 0.000                  | 0.000                  | 3                   | 2                 |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers     | G4          | 25    | R                       | NHH                      | 0                          | 0.001                  | 0.000                  | 0.000                  | 3                   | 0                 |
| Lawn and Garden Equipment  | Shredders                     | G2          | 15    | C                       | NHH                      | 2                          | 0.008                  | 0.000                  | 0.000                  | 10                  | 4                 |
| Lawn and Garden Equipment  | Shredders                     | G2          | 15    | R                       | NHH                      | 0                          | 0.002                  | 0.000                  | 0.000                  | 354                 | 1                 |
| Lawn and Garden Equipment  | Shredders                     | G4          | 5     | C                       | NHH                      | 3                          | 0.015                  | 0.000                  | 0.000                  | 26                  | 10                |
| Lawn and Garden Equipment  | Shredders                     | G4          | 5     | R                       | NHH                      | 1                          | 0.004                  | 0.000                  | 0.000                  | 979                 | 2                 |
| Lawn and Garden Equipment  | Snowblowers                   | G2          | 15    | C                       | HH                       | 0                          | 0.002                  | 0.000                  | 0.000                  | 16                  | 2                 |
| Lawn and Garden Equipment  | Snowblowers                   | G2          | 15    | R                       | HH                       | 0                          | 0.001                  | 0.000                  | 0.000                  | 142                 | 1                 |
| Lawn and Garden Equipment  | Snowblowers                   | G2          | 25    | C                       | HH                       | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Snowblowers                   | G2          | 25    | R                       | HH                       | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Snowblowers                   | G4          | 5     | C                       | NHH                      | 3                          | 0.013                  | 0.000                  | 0.000                  | 170                 | 20                |
| Lawn and Garden Equipment  | Snowblowers                   | G4          | 5     | R                       | NHH                      | 1                          | 0.005                  | 0.000                  | 0.000                  | 1,529               | 8                 |
| Lawn and Garden Equipment  | Snowblowers                   | G4          | 15    | C                       | NHH                      | 5                          | 0.023                  | 0.000                  | 0.000                  | 129                 | 15                |
| Lawn and Garden Equipment  | Snowblowers                   | G4          | 15    | R                       | NHH                      | 2                          | 0.009                  | 0.000                  | 0.000                  | 1,157               | 6                 |
| Lawn and Garden Equipment  | Snowblowers                   | G4          | 25    | C                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Snowblowers                   | G4          | 25    | R                       | NHH                      | 0                          | 0.000                  | 0.000                  | 0.000                  | 3                   | 0                 |
| Lawn and Garden Equipment  | Snowblowers                   | D           | 175   | U                       | NHH                      | 0                          | 0.003                  | 0.000                  | 0.000                  | 0                   | 0                 |
| Lawn and Garden Equipment  | Snowblowers                   | D           | 250   | U                       | NHH                      | 7                          | 0.082                  | 0.000                  | 0.000                  | 1                   | 1                 |
| Lawn and Garden Equipment  | Snowblowers                   | D           | 500   | U                       | NHH                      | 33                         | 0.364                  | 0.000                  | 0.000                  | 2                   | 2                 |
| Lawn and Garden Equipment  | Tillers                       | G4          | 5     | C                       | NHH                      | 3                          | 0.016                  | 0.000                  | 0.000                  | 139                 | 21                |
| Lawn and Garden Equipment  | Tillers                       | G4          | 5     | R                       | NHH                      | 4                          | 0.020                  | 0.000                  | 0.000                  | 538                 | 27                |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2          | 2     | C                       | HH                       | 19                         | 0.093                  | 0.001                  | 0.000                  | 1,317               | 438               |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G2          | 2     | R                       | HH                       | 37                         | 0.184                  | 0.001                  | 0.000                  | 14,683              | 865               |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4          | 5     | C                       | NHH                      | 3                          | 0.015                  | 0.000                  | 0.000                  | 244                 | 91                |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters | G4          | 5     | R                       | NHH                      | 2                          | 0.011                  | 0.000                  | 0.000                  | 1,136               | 67                |
| Lawn and Garden Equipment  | Wood Splitters                | G4          | 5     | C                       | NHH                      | 5                          | 0.026                  | 0.000                  | 0.000                  | 45                  | 16                |
| Lawn and Garden Equipment  | Wood Splitters                | G4          | 5     | R                       | NHH                      | 1                          | 0.006                  | 0.000                  | 0.000                  | 1,126               | 3                 |
| Light Commercial Equipment | Air Compressors               | G4          | 5     | C                       | NHH                      | 10                         | 0.057                  | 0.000                  | 0.000                  | 28                  | 43                |
| Light Commercial Equipment | Air Compressors               | G4          | 5     | R                       | NHH                      | 5                          | 0.030                  | 0.000                  | 0.000                  | 22                  | 23                |
| Light Commercial Equipment | Air Compressors               | G4          | 15    | C                       | NHH                      | 8                          | 0.040                  | 0.000                  | 0.000                  | 14                  | 22                |
| Light Commercial Equipment | Air Compressors               | G4          | 15    | R                       | NHH                      | 4                          | 0.021                  | 0.000                  | 0.000                  | 11                  | 12                |



| Class of Equipment         | Equipment        | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|----------------------------|------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                            |                  | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Light Commercial Equipment | Air Compressors  | G4             | 25    | C                          | NHH                         | 3                        | 0.013                     | 0.000                     | 0.000                     | 2                      | 3                    |
| Light Commercial Equipment | Air Compressors  | G4             | 25    | R                          | NHH                         | 2                        | 0.007                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Light Commercial Equipment | Air Compressors  | G4             | 50    | U                          | NHH                         | 10                       | 0.073                     | 0.000                     | 0.000                     | 3                      | 4                    |
| Light Commercial Equipment | Air Compressors  | G4             | 120   | U                          | NHH                         | 52                       | 0.466                     | 0.000                     | 0.000                     | 11                     | 14                   |
| Light Commercial Equipment | Air Compressors  | G4             | 175   | U                          | NHH                         | 6                        | 0.058                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Air Compressors  | D              | 15    | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Air Compressors  | D              | 25    | U                          | NHH                         | 1                        | 0.013                     | 0.000                     | 0.000                     | 1                      | 2                    |
| Light Commercial Equipment | Air Compressors  | D              | 50    | U                          | NHH                         | 16                       | 0.180                     | 0.000                     | 0.000                     | 7                      | 16                   |
| Light Commercial Equipment | Air Compressors  | D              | 120   | U                          | NHH                         | 230                      | 2.528                     | 0.000                     | 0.000                     | 48                     | 108                  |
| Light Commercial Equipment | Air Compressors  | D              | 175   | U                          | NHH                         | 16                       | 0.180                     | 0.000                     | 0.000                     | 2                      | 4                    |
| Light Commercial Equipment | Air Compressors  | D              | 250   | U                          | NHH                         | 34                       | 0.376                     | 0.000                     | 0.000                     | 3                      | 6                    |
| Light Commercial Equipment | Air Compressors  | D              | 500   | U                          | NHH                         | 78                       | 0.867                     | 0.000                     | 0.000                     | 3                      | 7                    |
| Light Commercial Equipment | Air Compressors  | D              | 750   | U                          | NHH                         | 45                       | 0.501                     | 0.000                     | 0.000                     | 1                      | 3                    |
| Light Commercial Equipment | Air Compressors  | D              | 1000  | U                          | NHH                         | 2                        | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Gas Compressors  | C4             | 50    | U                          | NHH                         | 19                       | 0.130                     | 0.000                     | 0.000                     | 0                      | 6                    |
| Light Commercial Equipment | Gas Compressors  | C4             | 120   | U                          | NHH                         | 111                      | 0.732                     | 0.000                     | 0.000                     | 0                      | 11                   |
| Light Commercial Equipment | Gas Compressors  | C4             | 175   | U                          | NHH                         | 29                       | 0.191                     | 0.000                     | 0.000                     | 0                      | 2                    |
| Light Commercial Equipment | Gas Compressors  | C4             | 250   | U                          | NHH                         | 30                       | 0.196                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Gas Compressors  | C4             | 500   | U                          | NHH                         | 42                       | 0.277                     | 0.000                     | 0.000                     | 0                      | 1                    |
| Light Commercial Equipment | Generator Sets   | G2             | 2     | C                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 17                     | 6                    |
| Light Commercial Equipment | Generator Sets   | G2             | 2     | R                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 13                     | 3                    |
| Light Commercial Equipment | Generator Sets   | G2             | 15    | C                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Generator Sets   | G2             | 15    | R                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Generator Sets   | G4             | 5     | C                          | NHH                         | 17                       | 0.103                     | 0.000                     | 0.000                     | 217                    | 80                   |
| Light Commercial Equipment | Generator Sets   | G4             | 5     | R                          | NHH                         | 9                        | 0.054                     | 0.000                     | 0.000                     | 171                    | 42                   |
| Light Commercial Equipment | Generator Sets   | G4             | 15    | C                          | NHH                         | 131                      | 0.635                     | 0.000                     | 0.001                     | 596                    | 219                  |
| Light Commercial Equipment | Generator Sets   | G4             | 15    | R                          | NHH                         | 69                       | 0.336                     | 0.000                     | 0.000                     | 469                    | 116                  |
| Light Commercial Equipment | Generator Sets   | G4             | 25    | C                          | NHH                         | 153                      | 0.721                     | 0.000                     | 0.000                     | 320                    | 118                  |
| Light Commercial Equipment | Generator Sets   | G4             | 25    | R                          | NHH                         | 81                       | 0.381                     | 0.000                     | 0.000                     | 252                    | 62                   |
| Light Commercial Equipment | Generator Sets   | G4             | 50    | U                          | NHH                         | 75                       | 0.631                     | 0.000                     | 0.000                     | 107                    | 34                   |
| Light Commercial Equipment | Generator Sets   | G4             | 120   | U                          | NHH                         | 34                       | 0.312                     | 0.000                     | 0.000                     | 21                     | 6                    |
| Light Commercial Equipment | Generator Sets   | G4             | 175   | U                          | NHH                         | 6                        | 0.050                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Light Commercial Equipment | Generator Sets   | C4             | 120   | U                          | NHH                         | 3                        | 0.020                     | 0.000                     | 0.000                     | 2                      | 0                    |
| Light Commercial Equipment | Generator Sets   | C4             | 175   | U                          | NHH                         | 4                        | 0.030                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Light Commercial Equipment | Generator Sets   | D              | 15    | U                          | NHH                         | 17                       | 0.186                     | 0.000                     | 0.000                     | 39                     | 36                   |
| Light Commercial Equipment | Generator Sets   | D              | 25    | U                          | NHH                         | 21                       | 0.235                     | 0.000                     | 0.000                     | 29                     | 27                   |
| Light Commercial Equipment | Generator Sets   | D              | 50    | U                          | NHH                         | 45                       | 0.498                     | 0.000                     | 0.000                     | 35                     | 33                   |
| Light Commercial Equipment | Generator Sets   | D              | 120   | U                          | NHH                         | 175                      | 1.927                     | 0.000                     | 0.000                     | 54                     | 49                   |
| Light Commercial Equipment | Generator Sets   | D              | 175   | U                          | NHH                         | 19                       | 0.207                     | 0.000                     | 0.000                     | 3                      | 3                    |
| Light Commercial Equipment | Generator Sets   | D              | 250   | U                          | NHH                         | 16                       | 0.174                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Light Commercial Equipment | Generator Sets   | D              | 500   | U                          | NHH                         | 55                       | 0.612                     | 0.000                     | 0.000                     | 4                      | 4                    |
| Light Commercial Equipment | Generator Sets   | D              | 750   | U                          | NHH                         | 55                       | 0.614                     | 0.000                     | 0.000                     | 2                      | 2                    |
| Light Commercial Equipment | Generator Sets   | D              | 9999  | U                          | NHH                         | 28                       | 0.308                     | 0.000                     | 0.000                     | 1                      | 1                    |
| Light Commercial Equipment | Pressure Washers | G4             | 5     | C                          | NHH                         | 7                        | 0.043                     | 0.000                     | 0.000                     | 58                     | 21                   |
| Light Commercial Equipment | Pressure Washers | G4             | 5     | R                          | NHH                         | 4                        | 0.023                     | 0.000                     | 0.000                     | 46                     | 11                   |
| Light Commercial Equipment | Pressure Washers | G4             | 15    | C                          | NHH                         | 11                       | 0.054                     | 0.000                     | 0.000                     | 52                     | 19                   |
| Light Commercial Equipment | Pressure Washers | G4             | 15    | R                          | NHH                         | 6                        | 0.028                     | 0.000                     | 0.000                     | 41                     | 10                   |
| Light Commercial Equipment | Pressure Washers | G4             | 25    | C                          | NHH                         | 6                        | 0.026                     | 0.000                     | 0.000                     | 10                     | 4                    |
| Light Commercial Equipment | Pressure Washers | G4             | 25    | R                          | NHH                         | 3                        | 0.014                     | 0.000                     | 0.000                     | 8                      | 2                    |
| Light Commercial Equipment | Pressure Washers | G4             | 50    | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Light Commercial Equipment | Pressure Washers | D              | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 2                      | 1                    |
| Light Commercial Equipment | Pressure Washers | D              | 25    | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Light Commercial Equipment | Pressure Washers | D              | 50    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Light Commercial Equipment | Pressure Washers | D              | 120   | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |

| Class of Equipment              | Equipment        | Engine      | MaxHP | Commercial or           |                          | Fuel  | CO2 Exhaust | CH4 Exhaust | N2O Exhaust | Number of | Activity |
|---------------------------------|------------------|-------------|-------|-------------------------|--------------------------|-------|-------------|-------------|-------------|-----------|----------|
|                                 |                  | Type & Fuel |       | Residential Application | Handheld or Non-handheld |       |             |             |             |           |          |
| Light Commercial Equipment      | Pumps            | G2          | 2     | C                       | NHH                      | 2     | 0.015       | 0.000       | 0.000       | 66        | 46       |
| Light Commercial Equipment      | Pumps            | G2          | 2     | R                       | NHH                      | 1     | 0.008       | 0.000       | 0.000       | 52        | 25       |
| Light Commercial Equipment      | Pumps            | G2          | 15    | C                       | NHH                      | 6     | 0.033       | 0.000       | 0.000       | 18        | 13       |
| Light Commercial Equipment      | Pumps            | G2          | 15    | R                       | NHH                      | 3     | 0.017       | 0.000       | 0.000       | 14        | 7        |
| Light Commercial Equipment      | Pumps            | G2          | 25    | C                       | NHH                      | 0     | 0.001       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Pumps            | G2          | 25    | R                       | NHH                      | 0     | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Pumps            | G4          | 5     | C                       | NHH                      | 9     | 0.053       | 0.000       | 0.000       | 77        | 54       |
| Light Commercial Equipment      | Pumps            | G4          | 5     | R                       | NHH                      | 5     | 0.028       | 0.000       | 0.000       | 61        | 29       |
| Light Commercial Equipment      | Pumps            | G4          | 15    | C                       | NHH                      | 32    | 0.154       | 0.000       | 0.000       | 83        | 59       |
| Light Commercial Equipment      | Pumps            | G4          | 15    | R                       | NHH                      | 17    | 0.081       | 0.000       | 0.000       | 66        | 31       |
| Light Commercial Equipment      | Pumps            | G4          | 25    | C                       | NHH                      | 18    | 0.084       | 0.000       | 0.000       | 21        | 15       |
| Light Commercial Equipment      | Pumps            | G4          | 25    | R                       | NHH                      | 10    | 0.044       | 0.000       | 0.000       | 17        | 8        |
| Light Commercial Equipment      | Pumps            | G4          | 50    | U                       | NHH                      | 12    | 0.095       | 0.000       | 0.000       | 9         | 5        |
| Light Commercial Equipment      | Pumps            | G4          | 120   | U                       | NHH                      | 39    | 0.358       | 0.000       | 0.000       | 11        | 7        |
| Light Commercial Equipment      | Pumps            | G4          | 175   | U                       | NHH                      | 2     | 0.016       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Pumps            | D           | 15    | U                       | NHH                      | 11    | 0.121       | 0.000       | 0.000       | 30        | 33       |
| Light Commercial Equipment      | Pumps            | D           | 25    | U                       | NHH                      | 9     | 0.095       | 0.000       | 0.000       | 9         | 10       |
| Light Commercial Equipment      | Pumps            | D           | 50    | U                       | NHH                      | 27    | 0.292       | 0.000       | 0.000       | 15        | 17       |
| Light Commercial Equipment      | Pumps            | D           | 120   | U                       | NHH                      | 118   | 1.298       | 0.000       | 0.000       | 30        | 33       |
| Light Commercial Equipment      | Pumps            | D           | 175   | U                       | NHH                      | 23    | 0.253       | 0.000       | 0.000       | 3         | 4        |
| Light Commercial Equipment      | Pumps            | D           | 250   | U                       | NHH                      | 24    | 0.261       | 0.000       | 0.000       | 2         | 3        |
| Light Commercial Equipment      | Pumps            | D           | 500   | U                       | NHH                      | 1     | 0.009       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Pumps            | D           | 750   | U                       | NHH                      | 0     | 0.002       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Pumps            | D           | 9999  | U                       | NHH                      | 12    | 0.127       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Welders          | G4          | 15    | C                       | NHH                      | 17    | 0.082       | 0.000       | 0.000       | 54        | 31       |
| Light Commercial Equipment      | Welders          | G4          | 25    | C                       | NHH                      | 99    | 0.459       | 0.000       | 0.000       | 197       | 112      |
| Light Commercial Equipment      | Welders          | G4          | 50    | U                       | NHH                      | 23    | 0.191       | 0.000       | 0.000       | 17        | 10       |
| Light Commercial Equipment      | Welders          | G4          | 120   | U                       | NHH                      | 33    | 0.300       | 0.000       | 0.000       | 17        | 10       |
| Light Commercial Equipment      | Welders          | G4          | 175   | U                       | NHH                      | 4     | 0.037       | 0.000       | 0.000       | 1         | 1        |
| Light Commercial Equipment      | Welders          | D           | 15    | U                       | NHH                      | 7     | 0.073       | 0.000       | 0.000       | 13        | 24       |
| Light Commercial Equipment      | Welders          | D           | 25    | U                       | NHH                      | 11    | 0.117       | 0.000       | 0.000       | 12        | 21       |
| Light Commercial Equipment      | Welders          | D           | 50    | U                       | NHH                      | 76    | 0.827       | 0.000       | 0.000       | 36        | 64       |
| Light Commercial Equipment      | Welders          | D           | 120   | U                       | NHH                      | 89    | 0.978       | 0.000       | 0.000       | 28        | 50       |
| Light Commercial Equipment      | Welders          | D           | 175   | U                       | NHH                      | 1     | 0.012       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Welders          | D           | 250   | U                       | NHH                      | 0     | 0.003       | 0.000       | 0.000       | 0         | 0        |
| Light Commercial Equipment      | Welders          | D           | 500   | U                       | NHH                      | 1     | 0.011       | 0.000       | 0.000       | 0         | 0        |
| Logging Equipment               | Chainsaws        | G2          | 15    | U                       | HH                       | 358   | 1.515       | 0.017       | 0.001       | 770       | 435      |
| Logging Equipment               | Fellers/Bunchers | D           | 120   | U                       | NHH                      | 1,427 | 15.666      | 0.001       | 0.000       | 98        | 342      |
| Logging Equipment               | Fellers/Bunchers | D           | 175   | U                       | NHH                      | 2,601 | 28.595      | 0.001       | 0.000       | 121       | 423      |
| Logging Equipment               | Fellers/Bunchers | D           | 250   | U                       | NHH                      | 2,273 | 25.137      | 0.001       | 0.000       | 74        | 258      |
| Logging Equipment               | Fellers/Bunchers | D           | 500   | U                       | NHH                      | 1,003 | 11.092      | 0.000       | 0.000       | 22        | 76       |
| Logging Equipment               | Fellers/Bunchers | D           | 750   | U                       | NHH                      | 152   | 1.681       | 0.000       | 0.000       | 2         | 6        |
| Logging Equipment               | Shredders        | G4          | 15    | U                       | NHH                      | 505   | 2.429       | 0.002       | 0.002       | 1,208     | 802      |
| Logging Equipment               | Shredders        | D           | 175   | U                       | NHH                      | 0     | 0.002       | 0.000       | 0.000       | 0         | 0        |
| Logging Equipment               | Skidders         | D           | 120   | U                       | NHH                      | 766   | 8.410       | 0.000       | 0.000       | 45        | 178      |
| Logging Equipment               | Skidders         | D           | 175   | U                       | NHH                      | 1,811 | 19.911      | 0.001       | 0.000       | 72        | 284      |
| Logging Equipment               | Skidders         | D           | 250   | U                       | NHH                      | 996   | 11.009      | 0.000       | 0.000       | 26        | 105      |
| Logging Equipment               | Skidders         | D           | 500   | U                       | NHH                      | 67    | 0.737       | 0.000       | 0.000       | 1         | 6        |
| Military Tactical Support Equip | A/C unit         | D           | 120   | U                       | NHH                      | 0     | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | A/C unit         | D           | 250   | U                       | NHH                      | 0     | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | A/C unit         | D           | 500   | U                       | NHH                      | 0     | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Aircraft Support | D           | 120   | U                       | NHH                      | 0     | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Aircraft Support | D           | 175   | U                       | NHH                      | 0     | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Cart             | D           | 120   | U                       | NHH                      | 0     | 0.000       | 0.000       | 0.000       | 0         | 0        |

| Class of Equipment              | Equipment                        | Engine      | MaxHP | Commercial or           |                          | Fuel | CO2 Exhaust | CH4 Exhaust | N2O Exhaust | Number of | Activity |
|---------------------------------|----------------------------------|-------------|-------|-------------------------|--------------------------|------|-------------|-------------|-------------|-----------|----------|
|                                 |                                  | Type & Fuel |       | Residential Application | Handheld or Non-handheld |      |             |             |             |           |          |
| Military Tactical Support Equip | Cart                             | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Cart                             | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Communications                   | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Communications                   | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Compressor (Military)            | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Compressor (Military)            | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Compressor (Military)            | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Compressor (Military)            | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Compressor (Military)            | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Crane                            | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Crane                            | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Crane                            | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Deicer                           | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Generator (Military)             | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Generator (Military)             | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Generator (Military)             | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Generator (Military)             | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Generator (Military)             | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Generator (Military)             | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Hydraulic unit                   | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Lift (Military)                  | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Light                            | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Other tactical support equipment | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Other tactical support equipment | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Other tactical support equipment | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Other tactical support equipment | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Other tactical support equipment | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Other tactical support equipment | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Pressure Washers                 | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Pump (Military)                  | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Pump (Military)                  | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Start Cart                       | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Start Cart                       | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Test Stand                       | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Test Stand                       | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Test Stand                       | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Test Stand                       | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Welder                           | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Military Tactical Support Equip | Welder                           | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Compressors (Workover)           | D           | 25    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Compressors (Workover)           | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Compressors (Workover)           | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Compressors (Workover)           | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Compressors (Workover)           | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Compressors (Workover)           | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Compressors (Workover)           | D           | 1000  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig                        | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig                        | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig                        | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig                        | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig                        | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig                        | D           | 1000  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig (Mobile)               | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling                    | Drill Rig (Mobile)               | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |




| Class of Equipment       | Equipment                | Engine      | MaxHP | Commercial or           |                          | Fuel | CO2 Exhaust | CH4 Exhaust | N2O Exhaust | Number of | Activity |
|--------------------------|--------------------------|-------------|-------|-------------------------|--------------------------|------|-------------|-------------|-------------|-----------|----------|
|                          |                          | Type & Fuel |       | Residential Application | Handheld or Non-handheld |      |             |             |             |           |          |
| Oil Drilling             | Drill Rig (Mobile)       | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Drill Rig (Mobile)       | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Drill Rig (Mobile)       | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Drill Rig (Mobile)       | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Drill Rig (Mobile)       | D           | 1000  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Drilling)     | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Drilling)     | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Drilling)     | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Drilling)     | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Drilling)     | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Drilling)     | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Workover)     | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Workover)     | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Workover)     | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Workover)     | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Workover)     | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Generator (Workover)     | D           | 9999  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Lift (Drilling)          | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Lift (Drilling)          | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Lift (Drilling)          | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Lift (Drilling)          | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Lift (Drilling)          | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Other Workover Equipment | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Other Workover Equipment | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Other Workover Equipment | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Other Workover Equipment | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Other Workover Equipment | D           | 1000  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pressure Washers         | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Drilling)          | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Drilling)          | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Drilling)          | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Drilling)          | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Drilling)          | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Drilling)          | D           | 9999  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Workover)          | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Workover)          | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Workover)          | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Workover)          | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Pump (Workover)          | D           | 9999  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Snubbing                 | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Swivel                   | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Swivel                   | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Swivel                   | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Swivel                   | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Workover Rig (Mobile)    | D           | 50    | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Workover Rig (Mobile)    | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Workover Rig (Mobile)    | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Workover Rig (Mobile)    | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Workover Rig (Mobile)    | D           | 500   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Workover Rig (Mobile)    | D           | 750   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Oil Drilling             | Workover Rig (Mobile)    | D           | 1000  | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Other Portable Equipment | Misc Portable Equipment  | D           | 120   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Other Portable Equipment | Misc Portable Equipment  | D           | 175   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |
| Other Portable Equipment | Misc Portable Equipment  | D           | 250   | U                       | NHH                      | 0    | 0.000       | 0.000       | 0.000       | 0         | 0        |

| Class of Equipment       | Equipment                            | Engine         | MaxHP | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|--------------------------|--------------------------------------|----------------|-------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
|                          |                                      | Type<br>& Fuel |       | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |
| Other Portable Equipment | Misc Portable Equipment              | D              | 500   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment              | D              | 750   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Other Portable Equipment | Misc Portable Equipment              | D              | 1000  | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Pleasure Craft           | Personal Water Craft                 | G2             | 9999  | U                          | NHH                         | 15,158                   | 135.323                   | 0.103                     | 0.028                     | 60,413                 | 4,076                |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine    | G4             | 15    | U                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 99                     | 3                    |
| Pleasure Craft           | Sailboat Auxiliary Inboard Engine    | D              | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 1                      | 0                    |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin    | G2             | 15    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 64                     | 2                    |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin    | G2             | 25    | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 35                     | 1                    |
| Pleasure Craft           | Sailboat Auxiliary Outboard Engin    | G2             | 50    | U                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 32                     | 1                    |
| Pleasure Craft           | Vessels w/Inboard Engines            | G4             | 250   | U                          | NHH                         | 10,601                   | 82.440                    | 0.015                     | 0.013                     | 7,658                  | 1,946                |
| Pleasure Craft           | Vessels w/Inboard Engines            | D              | 250   | U                          | NHH                         | 4                        | 0.038                     | 0.000                     | 0.000                     | 3                      | 1                    |
| Pleasure Craft           | Vessels w/Inboard Jet Engines        | G4             | 500   | U                          | NHH                         | 1,707                    | 13.317                    | 0.002                     | 0.002                     | 1,327                  | 265                  |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 2     | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 127                    | 17                   |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 15    | U                          | NHH                         | 115                      | 0.837                     | 0.003                     | 0.001                     | 7,019                  | 921                  |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 25    | U                          | NHH                         | 98                       | 0.758                     | 0.002                     | 0.000                     | 1,907                  | 250                  |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 50    | U                          | NHH                         | 285                      | 2.497                     | 0.002                     | 0.001                     | 1,862                  | 244                  |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 120   | U                          | NHH                         | 528                      | 4.635                     | 0.004                     | 0.001                     | 1,637                  | 215                  |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 175   | U                          | NHH                         | 437                      | 3.821                     | 0.003                     | 0.001                     | 756                    | 99                   |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 250   | U                          | NHH                         | 162                      | 1.441                     | 0.001                     | 0.000                     | 217                    | 28                   |
| Pleasure Craft           | Vessels w/Outboard Engines           | G2             | 500   | U                          | NHH                         | 47                       | 0.407                     | 0.000                     | 0.000                     | 44                     | 6                    |
| Pleasure Craft           | Vessels w/Outboard Engines           | G4             | 50    | U                          | NHH                         | 117                      | 0.794                     | 0.000                     | 0.000                     | 651                    | 85                   |
| Pleasure Craft           | Vessels w/Sterndrive Engines         | G4             | 250   | U                          | NHH                         | 12,911                   | 100.967                   | 0.018                     | 0.018                     | 16,147                 | 3,221                |
| Railyard Operations      | Compressor (Railyard)                | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Railyard Operations      | Crane (Rail-CHE)                     | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Railyard Operations      | Crane (Rail-CHE)                     | D              | 175   | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Railyard Operations      | Generator (Railyard)                 | D              | 175   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Railyard Operations      | Generator (Railyard)                 | D              | 9999  | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Railyard Operations      | Materials Handling (Rail-CHE)        | D              | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Active   | G2             | 15    | U                          | NHH                         | 98                       | 0.329                     | 0.006                     | 0.000                     | 701                    | 2,595                |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Active   | G2             | 25    | U                          | NHH                         | 64                       | 0.214                     | 0.004                     | 0.000                     | 456                    | 1,689                |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Active   | G2             | 50    | U                          | NHH                         | 84                       | 0.282                     | 0.005                     | 0.000                     | 600                    | 2,223                |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Active   | G4             | 15    | U                          | NHH                         | 40                       | 0.268                     | 0.000                     | 0.001                     | 572                    | 2,117                |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Active   | G4             | 25    | U                          | NHH                         | 557                      | 3.731                     | 0.002                     | 0.012                     | 7,956                  | 29,457               |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Active   | G4             | 50    | U                          | NHH                         | 25                       | 0.168                     | 0.000                     | 0.001                     | 359                    | 1,330                |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Inactive | G2             | 15    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 213                    | 788                  |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Inactive | G2             | 25    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 138                    | 513                  |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Inactive | G2             | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 182                    | 675                  |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Inactive | G4             | 15    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 174                    | 643                  |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Inactive | G4             | 25    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 2,415                  | 8,942                |
| Recreational Equipment   | All Terrain Vehicles (ATVs) Inactive | G4             | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 109                    | 404                  |
| Recreational Equipment   | Golf Carts                           | G2             | 15    | U                          | NHH                         | 562                      | 2.924                     | 0.002                     | 0.003                     | 494                    | 1,492                |
| Recreational Equipment   | Golf Carts                           | G4             | 15    | U                          | NHH                         | 474                      | 2.288                     | 0.001                     | 0.002                     | 386                    | 1,168                |
| Recreational Equipment   | Minibikes                            | G4             | 5     | U                          | NHH                         | 15                       | 0.008                     | 0.001                     | 0.000                     | 172                    | 65                   |
| Recreational Equipment   | Off-Road Motorcycles Active          | G2             | 15    | U                          | NHH                         | 68                       | 0.226                     | 0.004                     | 0.000                     | 481                    | 1,781                |
| Recreational Equipment   | Off-Road Motorcycles Active          | G2             | 25    | U                          | NHH                         | 58                       | 0.194                     | 0.004                     | 0.000                     | 414                    | 1,533                |
| Recreational Equipment   | Off-Road Motorcycles Active          | G2             | 50    | U                          | NHH                         | 473                      | 1.580                     | 0.030                     | 0.001                     | 3,370                  | 12,478               |
| Recreational Equipment   | Off-Road Motorcycles Active          | G2             | 120   | U                          | NHH                         | 226                      | 0.756                     | 0.014                     | 0.000                     | 1,612                  | 5,969                |
| Recreational Equipment   | Off-Road Motorcycles Active          | G4             | 15    | U                          | NHH                         | 65                       | 0.440                     | 0.000                     | 0.001                     | 938                    | 3,473                |
| Recreational Equipment   | Off-Road Motorcycles Active          | G4             | 25    | U                          | NHH                         | 105                      | 0.710                     | 0.000                     | 0.002                     | 1,514                  | 5,604                |
| Recreational Equipment   | Off-Road Motorcycles Active          | G4             | 50    | U                          | NHH                         | 110                      | 0.739                     | 0.000                     | 0.002                     | 1,577                  | 5,838                |
| Recreational Equipment   | Off-Road Motorcycles Inactive        | G2             | 15    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 193                    | 714                  |
| Recreational Equipment   | Off-Road Motorcycles Inactive        | G2             | 25    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 166                    | 614                  |
| Recreational Equipment   | Off-Road Motorcycles Inactive        | G2             | 50    | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 1,350                  | 4,998                |
| Recreational Equipment   | Off-Road Motorcycles Inactive        | G2             | 120   | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 646                    | 2,391                |


| Class of Equipment            | Equipment                     | Engine<br>Type<br>& Fuel | MaxHP | Commercial or<br>Residential<br>Application | Handheld or<br>Non-handheld | Fuel<br>Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |
|-------------------------------|-------------------------------|--------------------------|-------|---|-----------------------------|----------------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|
| Recreational Equipment        | Off-Road Motorcycles Inactive | G4                       | 15    | U   | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 376                    | 1,391                |
| Recreational Equipment        | Off-Road Motorcycles Inactive | G4                       | 25    | U   | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 606                    | 2,245                |
| Recreational Equipment        | Off-Road Motorcycles Inactive | G4                       | 50    | U   | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 632                    | 2,339                |
| Recreational Equipment        | Snowmobiles Active            | G2                       | 25    | U   | NHH                         | 13                               | 0.060                     | 0.000                     | 0.000                     | 118                    | 19                   |
| Recreational Equipment        | Snowmobiles Active            | G2                       | 50    | U   | NHH                         | 118                              | 0.534                     | 0.004                     | 0.000                     | 554                    | 87                   |
| Recreational Equipment        | Snowmobiles Active            | G2                       | 120   | U   | NHH                         | 369                              | 1.661                     | 0.012                     | 0.001                     | 1,008                  | 159                  |
| Recreational Equipment        | Snowmobiles Inactive          | G2                       | 25    | U   | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 41                     | 6                    |
| Recreational Equipment        | Snowmobiles Inactive          | G2                       | 50    | U   | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 193                    | 30                   |
| Recreational Equipment        | Snowmobiles Inactive          | G2                       | 120   | U   | NHH                         | 0                                | 0.000                     | 0.000                     | 0.000                     | 351                    | 55                   |
| Recreational Equipment        | Specialty Vehicles Carts      | G2                       | 15    | U   | NHH                         | 75                               | 0.393                     | 0.000                     | 0.000                     | 1,125                  | 205                  |
| Recreational Equipment        | Specialty Vehicles Carts      | G4                       | 5     | U   | NHH                         | 2                                | 0.009                     | 0.000                     | 0.000                     | 35                     | 6                    |
| Recreational Equipment        | Specialty Vehicles Carts      | G4                       | 15    | U   | NHH                         | 34                               | 0.165                     | 0.000                     | 0.000                     | 472                    | 86                   |
| Recreational Equipment        | Specialty Vehicles Carts      | G4                       | 25    | U   | NHH                         | 52                               | 0.246                     | 0.000                     | 0.000                     | 259                    | 47                   |
| Transport Refrigeration Units | Transport Refrigeration Units | G4                       | 15    | U   | NHH                         | 101                              | 0.488                     | 0.000                     | 0.000                     | 83                     | 172                  |
| Transport Refrigeration Units | Transport Refrigeration Units | D                        | 15    | U   | NHH                         | 285                              | 3.122                     | 0.000                     | 0.000                     | 273                    | 779                  |
| Transport Refrigeration Units | Transport Refrigeration Units | D                        | 25    | U   | NHH                         | 121                              | 1.330                     | 0.000                     | 0.000                     | 68                     | 195                  |
| Transport Refrigeration Units | Transport Refrigeration Units | D                        | 50    | U   | NHH                         | 11,067                           | 121.024                   | 0.008                     | 0.000                     | 2,324                  | 9,346                |




|  | <u>CO2</u>   | <u>CH4</u>   | <u>N2O</u>  | <u>units</u> | <u>source</u>                |
|--|--------------|--------------|---|--------------|------------------------------|
| Avg. daily emissions from Ag equipment in Shasta County  | 20           | 0            | 0   | tons/day     | wksht: Equip class processed |
| time conversion  | 365          | 365          | 365   | days/year    | 6.0 Unit Conversions.xlsx    |
| mass conversion  | 1.1023       | 1.1023       | 1.1023  | ton/MT       | 6.0 Unit Conversions.xlsx    |
| Avg. daily emissions from Ag equipment in Shasta County  | 6,502        | 1.53         | 1.02  | MT/year      | conversion calculation       |
| global warming potential                                 | 1            | 21           | 310   | unitless     | 6.0 Unit Conversions.xlsx    |
|  |              |              |   |              |                              |
|  | <u>value</u> | <u>units</u> | <u>source</u>                                     |              |                              |
| Total CO2-e emissions from Ag equipment in Shasta County | 6,850        | MT/year      | calculation                                       |              |                              |
| Breakdown of Population in County, by Jurisdiction       |              |              |   |              |                              |
| Redding  | 90,353       | residents    | 4.0 Population in Base Year 2008.xlsx; See Note 1 |              |                              |
| Anderson   | 10,561       | residents    | 4.0 Population in Base Year 2008.xlsx; See Note 1 |              |                              |
| Shasta Lake  | 10,262       | residents    | 4.0 Population in Base Year 2008.xlsx; See Note 1 |              |                              |
| Unincorporated County                                    | 70,777       | residents    | 4.0 Population in Base Year 2008.xlsx; See Note 1 |              |                              |
| County Total   | 181,953      | residents    | 4.0 Population in Base Year 2008.xlsx; See Note 1 |              |                              |
| Breakdown, percentage                                    |              |              |   |              |                              |
| Redding  | 50%          | %            | proration calculation                             |              |                              |
| Anderson   | 6%           | %            | proration calculation                             |              |                              |
| Shasta Lake  | 6%           | %            | proration calculation                             |              |                              |
| Unincorporated County                                    | 39%          | %            | proration calculation                             |              |                              |
| County Total   | 100%         | %            | summation   |              |                              |
| Breakdown of CO2-e emissions by mass                     |              |              |   |              |                              |
| Redding  | 3,402        | MT/year      | calculation                                       |              |                              |
| Anderson   | 398          | MT/year      | calculation                                       |              |                              |
| Shasta Lake  | 386          | MT/year      | calculation                                       |              |                              |
| Unincorporated County                                    | 2,665        | MT/year      | calculation                                       |              |                              |
| County Total   | 6,850        | MT/year      | summation   |              |                              |


|                                  |                              | Engine         | Commercial or |                            | Fuel                        |                          |                           |                           |                           |       | Number of<br>Equipment | Activity<br>(hr/day) |  |
|----------------------------------|------------------------------|----------------|---------------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|-------|------------------------|----------------------|--|
| Class of Equipment               | Equipment                    | Type<br>& Fuel | MaxHP         | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) |       |                        |                      |  |
| Agricultural Equipment           | 2-Wheel Tractors             | G4             | 5             | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 11    | 5                      |                      |  |
| Agricultural Equipment           | 2-Wheel Tractors             | G4             | 15            | U                          | NHH                         | 5                        | 0.026                     | 0.000                     | 0.000                     | 12    | 11                     |                      |  |
| Agricultural Equipment           | 2-Wheel Tractors             | G4             | 25            | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Agricultural Mowers          | G4             | 15            | U                          | NHH                         | 2                        | 0.010                     | 0.000                     | 0.000                     | 11    | 5                      |                      |  |
| Agricultural Equipment           | Agricultural Mowers          | G4             | 25            | U                          | NHH                         | 4                        | 0.018                     | 0.000                     | 0.000                     | 9     | 4                      |                      |  |
| Agricultural Equipment           | Agricultural Mowers          | D              | 120           | U                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | G4             | 120           | U                          | NHH                         | 25                       | 0.218                     | 0.000                     | 0.000                     | 3     | 5                      |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | G4             | 175           | U                          | NHH                         | 5                        | 0.044                     | 0.000                     | 0.000                     | 0     | 1                      |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | D              | 15            | U                          | NHH                         | 72                       | 0.791                     | 0.000                     | 0.000                     | 103   | 150                    |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | D              | 25            | U                          | NHH                         | 170                      | 1.869                     | 0.000                     | 0.000                     | 127   | 185                    |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | D              | 50            | U                          | NHH                         | 602                      | 6.598                     | 0.000                     | 0.000                     | 296   | 386                    |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | D              | 120           | U                          | NHH                         | 1,478                    | 16.239                    | 0.000                     | 0.000                     | 342   | 446                    |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | D              | 175           | U                          | NHH                         | 1,422                    | 15.646                    | 0.000                     | 0.000                     | 193   | 251                    |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | D              | 250           | U                          | NHH                         | 1,306                    | 14.448                    | 0.000                     | 0.000                     | 125   | 162                    |                      |  |
| Agricultural Equipment           | Agricultural Tractors        | D              | 500           | U                          | NHH                         | 424                      | 4.693                     | 0.000                     | 0.000                     | 25    | 32                     |                      |  |
| Agricultural Equipment           | Balers                       | G4             | 50            | U                          | NHH                         | 4                        | 0.038                     | 0.000                     | 0.000                     | 12    | 2                      |                      |  |
| Agricultural Equipment           | Balers                       | G4             | 120           | U                          | NHH                         | 4                        | 0.035                     | 0.000                     | 0.000                     | 6     | 1                      |                      |  |
| Agricultural Equipment           | Balers                       | D              | 50            | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Balers                       | D              | 120           | U                          | NHH                         | 6                        | 0.068                     | 0.000                     | 0.000                     | 10    | 3                      |                      |  |
| Agricultural Equipment           | Combines                     | G4             | 120           | U                          | NHH                         | 2                        | 0.019                     | 0.000                     | 0.000                     | 1     | 0                      |                      |  |
| Agricultural Equipment           | Combines                     | G4             | 175           | U                          | NHH                         | 2                        | 0.016                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Combines                     | G4             | 250           | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Combines                     | D              | 120           | U                          | NHH                         | 13                       | 0.141                     | 0.000                     | 0.000                     | 7     | 3                      |                      |  |
| Agricultural Equipment           | Combines                     | D              | 175           | U                          | NHH                         | 25                       | 0.275                     | 0.000                     | 0.000                     | 11    | 4                      |                      |  |
| Agricultural Equipment           | Combines                     | D              | 250           | U                          | NHH                         | 37                       | 0.414                     | 0.000                     | 0.000                     | 11    | 5                      |                      |  |
| Agricultural Equipment           | Combines                     | D              | 500           | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | G4             | 5             | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 3     | 1                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | G4             | 15            | U                          | NHH                         | 3                        | 0.014                     | 0.000                     | 0.000                     | 5     | 6                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | G4             | 25            | U                          | NHH                         | 2                        | 0.011                     | 0.000                     | 0.000                     | 2     | 2                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | G4             | 50            | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | G4             | 120           | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | D              | 15            | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0     | 1                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | D              | 25            | U                          | NHH                         | 1                        | 0.015                     | 0.000                     | 0.000                     | 1     | 3                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | D              | 50            | U                          | NHH                         | 3                        | 0.031                     | 0.000                     | 0.000                     | 1     | 3                      |                      |  |
| Agricultural Equipment           | Hydro Power Units            | D              | 120           | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | G4             | 5             | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 2     | 1                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | G4             | 15            | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 2     | 1                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | G4             | 25            | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | G4             | 50            | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | G4             | 120           | U                          | NHH                         | 3                        | 0.023                     | 0.000                     | 0.000                     | 2     | 1                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | G4             | 175           | U                          | NHH                         | 1                        | 0.005                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | G4             | 250           | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | D              | 15            | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 1     | 2                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | D              | 25            | U                          | NHH                         | 3                        | 0.035                     | 0.000                     | 0.000                     | 4     | 5                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | D              | 50            | U                          | NHH                         | 4                        | 0.047                     | 0.000                     | 0.000                     | 4     | 4                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | D              | 120           | U                          | NHH                         | 29                       | 0.318                     | 0.000                     | 0.000                     | 12    | 12                     |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | D              | 175           | U                          | NHH                         | 4                        | 0.048                     | 0.000                     | 0.000                     | 1     | 1                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | D              | 250           | U                          | NHH                         | 6                        | 0.070                     | 0.000                     | 0.000                     | 1     | 1                      |                      |  |
| Agricultural Equipment           | Other Agricultural Equipment | D              | 500           | U                          | NHH                         | 2                        | 0.024                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Sprayers                     | G4             | 5             | U                          | NHH                         | 2                        | 0.011                     | 0.000                     | 0.000                     | 42    | 11                     |                      |  |
| Agricultural Equipment           | Sprayers                     | G4             | 15            | U                          | NHH                         | 1                        | 0.006                     | 0.000                     | 0.000                     | 13    | 3                      |                      |  |
| Agricultural Equipment           | Sprayers                     | G4             | 25            | U                          | NHH                         | 8                        | 0.036                     | 0.000                     | 0.000                     | 34    | 9                      |                      |  |
| Agricultural Equipment           | Sprayers                     | G4             | 50            | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 2     | 1                      |                      |  |
| Agricultural Equipment           | Sprayers                     | G4             | 120           | U                          | NHH                         | 3                        | 0.025                     | 0.000                     | 0.000                     | 4     | 1                      |                      |  |
| Agricultural Equipment           | Sprayers                     | G4             | 175           | U                          | NHH                         | 1                        | 0.011                     | 0.000                     | 0.000                     | 1     | 0                      |                      |  |
| Agricultural Equipment           | Sprayers                     | D              | 25            | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 2     | 1                      |                      |  |
| Agricultural Equipment           | Sprayers                     | D              | 50            | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Sprayers                     | D              | 120           | U                          | NHH                         | 3                        | 0.032                     | 0.000                     | 0.000                     | 5     | 1                      |                      |  |
| Agricultural Equipment           | Sprayers                     | D              | 175           | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 2     | 0                      |                      |  |
| Agricultural Equipment           | Sprayers                     | D              | 250           | U                          | NHH                         | 2                        | 0.023                     | 0.000                     | 0.000                     | 1     | 0                      |                      |  |
| Agricultural Equipment           | Sprayers                     | D              | 500           | U                          | NHH                         | 0                        | 0.004                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Swathers                     | G4             | 120           | U                          | NHH                         | 14                       | 0.127                     | 0.000                     | 0.000                     | 12    | 3                      |                      |  |
| Agricultural Equipment           | Swathers                     | G4             | 175           | U                          | NHH                         | 15                       | 0.138                     | 0.000                     | 0.000                     | 10    | 2                      |                      |  |
| Agricultural Equipment           | Swathers                     | D              | 120           | U                          | NHH                         | 38                       | 0.422                     | 0.000                     | 0.000                     | 52    | 16                     |                      |  |
| Agricultural Equipment           | Swathers                     | D              | 175           | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Tillers                      | G4             | 15            | U                          | NHH                         | 134                      | 0.652                     | 0.000                     | 0.001                     | 1,423 | 277                    |                      |  |
| Agricultural Equipment           | Tillers                      | D              | 15            | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Tillers                      | D              | 250           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Agricultural Equipment           | Tillers                      | D              | 500           | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | A/C Tug Narrow Body          | G4             | 175           | U                          | NHH                         | 2                        | 0.021                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | A/C Tug Narrow Body          | D              | 250           | U                          | NHH                         | 8                        | 0.085                     | 0.000                     | 0.000                     | 1     | 1                      |                      |  |
| Airport Ground Support Equipment | A/C Tug Wide Body            | G4             | 500           | U                          | NHH                         | 2                        | 0.018                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | A/C Tug Wide Body            | D              | 500           | U                          | NHH                         | 4                        | 0.048                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | Air Conditioner              | G4             | 175           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | Air Conditioner              | C4             | 175           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | Air Conditioner              | D              | 175           | U                          | NHH                         | 1                        | 0.014                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | Air Conditioner              | D              | 250           | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | Air Conditioner              | D              | 500           | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | Air Start Unit               | G4             | 175           | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0     | 0                      |                      |  |
| Airport Ground Support Equipment | Air Start Unit               | D              | 17            |                            |                             |                          |                           |                           |                           |       |                        |                      |  |





|                                   |                              | Engine      | Commercial or |                         | Fuel                     |                       |                        |                        |                        | Number of | Activity |  |
|-----------------------------------|------------------------------|-------------|---------------|-------------------------|--------------------------|-----------------------|------------------------|------------------------|------------------------|-----------|----------|--|
| Class of Equipment                | Equipment                    | Type & Fuel | MaxHP         | Residential Application | Handheld or Non-handheld | Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) |           |          |  |
| Airport Ground Support Equipment  | Sweeper                      | G4          | 120           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Airport Ground Support Equipment  | Sweeper                      | C4          | 50            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Airport Ground Support Equipment  | Sweeper                      | D           | 120           | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Airport Ground Support Equipment  | Water Truck                  | G4          | 175           | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Asphalt Pavers               | G4          | 15            | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 1         | 1        |  |
| Construction and Mining Equipment | Asphalt Pavers               | G4          | 25            | U                       | NHH                      | 2                     | 0.008                  | 0.000                  | 0.000                  | 1         | 1        |  |
| Construction and Mining Equipment | Asphalt Pavers               | G4          | 50            | U                       | NHH                      | 1                     | 0.009                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Asphalt Pavers               | G4          | 120           | U                       | NHH                      | 1                     | 0.009                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | G4          | 15            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | G4          | 25            | U                       | NHH                      | 1                     | 0.003                  | 0.000                  | 0.000                  | 1         | 0        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | G4          | 50            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | G4          | 120           | U                       | NHH                      | 1                     | 0.011                  | 0.000                  | 0.000                  | 1         | 0        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | G4          | 175           | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 15            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 25            | U                       | NHH                      | 1                     | 0.006                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 50            | U                       | NHH                      | 5                     | 0.053                  | 0.000                  | 0.000                  | 1         | 3        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 120           | U                       | NHH                      | 37                    | 0.404                  | 0.000                  | 0.000                  | 5         | 10       |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 175           | U                       | NHH                      | 16                    | 0.171                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 250           | U                       | NHH                      | 18                    | 0.196                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 500           | U                       | NHH                      | 65                    | 0.722                  | 0.000                  | 0.000                  | 2         | 5        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 750           | U                       | NHH                      | 73                    | 0.807                  | 0.000                  | 0.000                  | 1         | 3        |  |
| Construction and Mining Equipment | Bore/Drill Rigs              | D           | 1000          | U                       | NHH                      | 184                   | 2.041                  | 0.000                  | 0.000                  | 2         | 4        |  |
| Construction and Mining Equipment | Cement and Mortar Mixers     | G4          | 5             | U                       | NHH                      | 6                     | 0.033                  | 0.000                  | 0.000                  | 94        | 24       |  |
| Construction and Mining Equipment | Cement and Mortar Mixers     | G4          | 15            | U                       | NHH                      | 19                    | 0.089                  | 0.000                  | 0.000                  | 159       | 40       |  |
| Construction and Mining Equipment | Cement and Mortar Mixers     | G4          | 25            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 1         | 0        |  |
| Construction and Mining Equipment | Cement and Mortar Mixers     | D           | 15            | U                       | NHH                      | 1                     | 0.015                  | 0.000                  | 0.000                  | 6         | 5        |  |
| Construction and Mining Equipment | Cement and Mortar Mixers     | D           | 25            | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 1         | 0        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | G4          | 5             | U                       | NHH                      | 0                     | 0.003                  | 0.000                  | 0.000                  | 5         | 2        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | G4          | 15            | U                       | NHH                      | 14                    | 0.066                  | 0.000                  | 0.000                  | 23        | 20       |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | G4          | 25            | U                       | NHH                      | 8                     | 0.039                  | 0.000                  | 0.000                  | 7         | 6        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | G4          | 50            | U                       | NHH                      | 2                     | 0.021                  | 0.000                  | 0.000                  | 1         | 1        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | G4          | 120           | U                       | NHH                      | 2                     | 0.022                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | D           | 25            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | D           | 50            | U                       | NHH                      | 1                     | 0.010                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | D           | 120           | U                       | NHH                      | 4                     | 0.041                  | 0.000                  | 0.000                  | 1         | 1        |  |
| Construction and Mining Equipment | Concrete/Industrial Saws     | D           | 175           | U                       | NHH                      | 0                     | 0.003                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Cranes                       | G4          | 50            | U                       | NHH                      | 0                     | 0.003                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Cranes                       | G4          | 120           | U                       | NHH                      | 1                     | 0.011                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Cranes                       | G4          | 175           | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Cranes                       | D           | 50            | U                       | NHH                      | 1                     | 0.016                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Cranes                       | D           | 120           | U                       | NHH                      | 34                    | 0.372                  | 0.000                  | 0.000                  | 4         | 15       |  |
| Construction and Mining Equipment | Cranes                       | D           | 175           | U                       | NHH                      | 54                    | 0.597                  | 0.000                  | 0.000                  | 4         | 15       |  |
| Construction and Mining Equipment | Cranes                       | D           | 250           | U                       | NHH                      | 146                   | 1.614                  | 0.000                  | 0.000                  | 8         | 29       |  |
| Construction and Mining Equipment | Cranes                       | D           | 500           | U                       | NHH                      | 86                    | 0.950                  | 0.000                  | 0.000                  | 3         | 11       |  |
| Construction and Mining Equipment | Cranes                       | D           | 750           | U                       | NHH                      | 115                   | 1.274                  | 0.000                  | 0.000                  | 2         | 8        |  |
| Construction and Mining Equipment | Cranes                       | D           | 9999          | U                       | NHH                      | 463                   | 5.123                  | 0.000                  | 0.000                  | 3         | 11       |  |
| Construction and Mining Equipment | Crawler Tractors             | D           | 50            | U                       | NHH                      | 1                     | 0.006                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Crawler Tractors             | D           | 120           | U                       | NHH                      | 762                   | 8.354                  | 0.000                  | 0.000                  | 90        | 254      |  |
| Construction and Mining Equipment | Crawler Tractors             | D           | 175           | U                       | NHH                      | 474                   | 5.206                  | 0.000                  | 0.000                  | 31        | 86       |  |
| Construction and Mining Equipment | Crawler Tractors             | D           | 250           | U                       | NHH                      | 555                   | 6.133                  | 0.000                  | 0.000                  | 26        | 74       |  |
| Construction and Mining Equipment | Crawler Tractors             | D           | 500           | U                       | NHH                      | 593                   | 6.558                  | 0.000                  | 0.000                  | 18        | 51       |  |
| Construction and Mining Equipment | Crawler Tractors             | D           | 750           | U                       | NHH                      | 58                    | 0.644                  | 0.000                  | 0.000                  | 1         | 3        |  |
| Construction and Mining Equipment | Crawler Tractors             | D           | 1000          | U                       | NHH                      | 82                    | 0.910                  | 0.000                  | 0.000                  | 1         | 3        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | G4          | 15            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | G4          | 25            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | G4          | 120           | U                       | NHH                      | 1                     | 0.009                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | D           | 50            | U                       | NHH                      | 10                    | 0.105                  | 0.000                  | 0.000                  | 2         | 5        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | D           | 120           | U                       | NHH                      | 51                    | 0.558                  | 0.000                  | 0.000                  | 5         | 13       |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | D           | 175           | U                       | NHH                      | 43                    | 0.476                  | 0.000                  | 0.000                  | 2         | 6        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | D           | 250           | U                       | NHH                      | 6                     | 0.069                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | D           | 500           | U                       | NHH                      | 54                    | 0.595                  | 0.000                  | 0.000                  | 1         | 3        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | D           | 750           | U                       | NHH                      | 4                     | 0.047                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Crushing/Proc. Equipment     | D           | 9999          | U                       | NHH                      | 10                    | 0.105                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Dumpers/Tenders              | G4          | 5             | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 5         | 2        |  |
| Construction and Mining Equipment | Dumpers/Tenders              | G4          | 15            | U                       | NHH                      | 2                     | 0.007                  | 0.000                  | 0.000                  | 10        | 4        |  |
| Construction and Mining Equipment | Dumpers/Tenders              | G4          | 25            | U                       | NHH                      | 1                     | 0.003                  | 0.000                  | 0.000                  | 2         | 1        |  |
| Construction and Mining Equipment | Dumpers/Tenders              | G4          | 120           | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Dumpers/Tenders              | D           | 25            | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Excavators                   | D           | 25            | U                       | NHH                      | 1                     | 0.013                  | 0.000                  | 0.000                  | 0         | 2        |  |
| Construction and Mining Equipment | Excavators                   | D           | 50            | U                       | NHH                      | 70                    | 0.764                  | 0.000                  | 0.000                  | 16        | 61       |  |
| Construction and Mining Equipment | Excavators                   | D           | 120           | U                       | NHH                      | 557                   | 6.110                  | 0.000                  | 0.000                  | 43        | 166      |  |
| Construction and Mining Equipment | Excavators                   | D           | 175           | U                       | NHH                      | 1,635                 | 17.966                 | 0.001                  | 0.000                  | 83        | 320      |  |
| Construction and Mining Equipment | Excavators                   | D           | 250           | U                       | NHH                      | 935                   | 10.331                 | 0.000                  | 0.000                  | 34        | 130      |  |
| Construction and Mining Equipment | Excavators                   | D           | 500           | U                       | NHH                      | 993                   | 10.977                 | 0.000                  | 0.000                  | 24        | 94       |  |
| Construction and Mining Equipment | Excavators                   | D           | 750           | U                       | NHH                      | 39                    | 0.433                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Graders                      | D           | 50            | U                       | NHH                      | 1                     | 0.006                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Graders                      | D           | 120           | U                       | NHH                      | 93                    | 1.023                  | 0.000                  | 0.000                  | 11        | 27       |  |
| Construction and Mining Equipment | Graders                      | D           | 175           | U                       | NHH                      | 526                   | 5.776                  | 0.000                  | 0.000                  | 36        | 93       |  |
| Construction and Mining Equipment | Graders                      | D           | 250           | U                       | NHH                      | 450                   | 4.977                  | 0.000                  | 0.000                  | 23        | 58       |  |
| Construction and Mining Equipment | Graders                      | D           | 500           | U                       | NHH                      | 17                    | 0.188                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Graders                      | D           | 750           | U                       | NHH                      | 2                     | 0.023                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 120           | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 175           | U                       | NHH                      | 249                   | 2.737                  | 0.000                  | 0.000                  | 14        | 42       |  |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 250           | U                       | NHH                      | 234                   | 2.587                  | 0.000                  | 0.000                  | 13        | 40       |  |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 750           | U                       | NHH                      | 480                   | 5.301                  | 0.000                  | 0.000                  | 6         | 19       |  |
| Construction and Mining Equipment | Off-Highway Tractors         | D           | 1000          | U                       | NHH                      | 73                    | 0.801                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 175           | U                       | NHH                      | 23                    | 0.250                  | 0.000                  | 0.000                  | 1         | 4        |  |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 250           | U                       | NHH                      | 222                   | 2.457                  | 0.000                  | 0.000                  | 5         | 30       |  |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 500           | U                       | NHH                      | 512                   | 5.657                  | 0.000                  | 0.000                  | 8         | 42       |  |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 750           | U                       | NHH                      | 837                   | 9.248                  | 0.000                  | 0.000                  | 8         | 42       |  |
| Construction and Mining Equipment | Off-Highway Trucks           | D           | 1000          | U                       | NHH                      | 554                   | 6.128                  | 0.000                  | 0.000                  | 4         | 20       |  |
| Construction and Mining Equipment | Other Construction Equipment | G4          | 175           | U                       | NHH                      | 2                     | 0.023                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Other Construction Equipment | D           | 15            | U                       | NHH                      | 3                     | 0.036                  | 0.000                  | 0.000                  | 4         | 7        |  |
| Construction and Mining Equipment | Other Construction Equipment | D           | 25            | U                       | NHH                      | 1                     | 0.008                  | 0.000                  | 0.000                  | 1         | 1        |  |
| Construction and Mining Equipment | Other Construction Equipment | D           | 50            | U                       | NHH                      | 2                     | 0.026                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Other Construction Equipment | D           | 120           | U                       | NHH                      | 11                    | 0.125                  | 0.000                  | 0.000                  | 2         | 3        |  |
| Construction and Mining Equipment | Other Construction Equipment | D           | 175           | U                       | NHH                      | 21                    | 0.227                  | 0.000                  | 0.000                  | 2         | 4        |  |
| Construction and Mining Equipment | Other Construction Equipment | D           | 500           | U                       | NHH                      | 114                   | 1.256                  | 0.000                  | 0.000                  | 5         | 10       |  |
| Construction and Mining Equipment | Pavers                       | D           | 25            | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Pavers                       | D           | 50            | U                       | NHH                      | 29                    | 0.314                  | 0.000                  | 0.000                  | 10        | 22       |  |
| Construction and Mining Equipment | Pavers                       | D           | 120           | U                       | NHH                      | 83                    | 0.915                  | 0.000                  | 0.000                  | 12        | 26       |  |
| Construction and Mining Equipment | Pavers                       | D           | 175           | U                       | NHH                      | 96                    | 1.055                  | 0.000                  | 0.000                  | 7         | 16       |  |
| Construction and Mining Equipment | Pavers                       | D           | 250           | U                       | NHH                      | 17                    | 0.193                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Pavers                       | D           | 500           | U                       | NHH                      | 21                    | 0.237                  | 0.000                  | 0.000                  | 1         | 2        |  |
| Construction and Mining Equipment | Paving Equipment             | G4          | 5             | U                       | NHH                      | 6                     | 0.034                  | 0.000                  | 0.000                  | 66        | 31       |  |
| Construction and Mining Equipment | Paving Equipment             | G4          | 15            | U                       | NHH                      | 36                    | 0.171                  | 0.000                  | 0.000                  | 111       | 61       |  |
| Construction and Mining Equipment | Paving Equipment             | G4          | 25            | U                       | NHH                      | 2                     | 0.008                  | 0.000                  | 0.000                  | 2         | 1        |  |
| Construction and Mining Equipment | Paving Equipment             | G4          | 50            | U                       | NHH                      | 1                     | 0.011                  | 0.000                  | 0.000                  | 1         | 1        |  |
| Construction and Mining Equipment | Paving Equipment             | G4          | 120           | U                       | NHH                      | 1                     | 0.005                  | 0.000                  | 0.000                  | 0         | 0        |  |
| Construction and Mining Equipment | Paving Equipment             | D           | 25            | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Paving Equipment             | D           | 50            | U                       | NHH                      | 1                     | 0.007                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Paving Equipment             | D           | 120           | U                       | NHH                      | 20                    | 0.224                  | 0.000                  | 0.000                  | 4         | 8        |  |
| Construction and Mining Equipment | Paving Equipment             | D           | 175           | U                       | NHH                      | 18                    | 0.195                  | 0.000                  | 0.000                  | 2         | 4        |  |
| Construction and Mining Equipment | Paving Equipment             | D           | 250           | U                       | NHH                      | 6                     | 0.067                  | 0.000                  | 0.000                  | 0         | 1        |  |
| Construction and Mining Equipment | Plate Compactors             | G2          | 15            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 2         | 1        |  |
| Construction and Mining Equipment | Plate Compactors             | G4          | 5             | U                       | NHH                      | 4                     | 0.024                  | 0.000                  | 0.000                  | 47        | 23       |  |
| Construction and Mining Equipment | Plate Compactors             | G4          | 15            | U                       | NHH                      | 12                    | 0.059                  | 0.000                  | 0.000                  | 50        | 28       |  |
| Construction and Mining Equipment | Plate Compactors             | D           | 15            | U                       | NHH                      | 1                     | 0.013                  | 0.000                  | 0.000                  | 4         | 6        |  |
| Construction and Mining Equipment | Rollers                      | G4          | 5             | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 5         | 1        |  |
| Construction and Mining Equipment | Rollers                      | G4          | 15            | U                       | NHH                      | 4                     | 0.019                  | 0.000                  | 0.000                  | 8         | 7        |  |
| Construction and Mining Equipment | Rollers                      | G4          | 25            | U                       | NHH                      | 6                     | 0.027                  | 0.000                  |                        |           |          |  |

|                                   |                            | Engine      | Commercial or |                         | Fuel                     |                       |                        |                        |                        | Number of Equipment | Activity (hr/day) |  |
|-----------------------------------|----------------------------|-------------|---------------|-------------------------|--------------------------|-----------------------|------------------------|------------------------|------------------------|---------------------|-------------------|--|
| Class of Equipment                | Equipment                  | Type & Fuel | MaxHP         | Residential Application | Handheld or Non-handheld | Consumption (gal/day) | CO2 Exhaust (tons/day) | CH4 Exhaust (tons/day) | N2O Exhaust (tons/day) |                     |                   |  |
| Construction and Mining Equipment | Rubber Tired Dozers        | D           | 500           | U                       | NHH                      | 226                   | 2.498                  | 0.000                  | 0.000                  | 4                   | 19                |  |
| Construction and Mining Equipment | Rubber Tired Dozers        | D           | 750           | U                       | NHH                      | 130                   | 1.437                  | 0.000                  | 0.000                  | 2                   | 7                 |  |
| Construction and Mining Equipment | Rubber Tired Dozers        | D           | 1000          | U                       | NHH                      | 13                    | 0.144                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | G4          | 50            | U                       | NHH                      | 1                     | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | G4          | 120           | U                       | NHH                      | 6                     | 0.049                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 25            | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 50            | U                       | NHH                      | 12                    | 0.127                  | 0.000                  | 0.000                  | 3                   | 8                 |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 120           | U                       | NHH                      | 597                   | 6.545                  | 0.000                  | 0.000                  | 84                  | 222               |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 175           | U                       | NHH                      | 606                   | 6.658                  | 0.000                  | 0.000                  | 47                  | 125               |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 250           | U                       | NHH                      | 839                   | 9.278                  | 0.000                  | 0.000                  | 47                  | 125               |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 500           | U                       | NHH                      | 556                   | 6.142                  | 0.000                  | 0.000                  | 20                  | 52                |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 750           | U                       | NHH                      | 86                    | 0.956                  | 0.000                  | 0.000                  | 1                   | 4                 |  |
| Construction and Mining Equipment | Rubber Tired Loaders       | D           | 1000          | U                       | NHH                      | 11                    | 0.126                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Scrapers                   | D           | 120           | U                       | NHH                      | 6                     | 0.063                  | 0.000                  | 0.000                  | 0                   | 1                 |  |
| Construction and Mining Equipment | Scrapers                   | D           | 175           | U                       | NHH                      | 82                    | 0.906                  | 0.000                  | 0.000                  | 4                   | 12                |  |
| Construction and Mining Equipment | Scrapers                   | D           | 250           | U                       | NHH                      | 113                   | 1.249                  | 0.000                  | 0.000                  | 4                   | 12                |  |
| Construction and Mining Equipment | Scrapers                   | D           | 500           | U                       | NHH                      | 477                   | 5.277                  | 0.000                  | 0.000                  | 11                  | 33                |  |
| Construction and Mining Equipment | Scrapers                   | D           | 750           | U                       | NHH                      | 146                   | 1.618                  | 0.000                  | 0.000                  | 2                   | 6                 |  |
| Construction and Mining Equipment | Signal Boards              | G4          | 5             | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Signal Boards              | G4          | 15            | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Signal Boards              | D           | 15            | U                       | NHH                      | 19                    | 0.203                  | 0.000                  | 0.000                  | 32                  | 66                |  |
| Construction and Mining Equipment | Signal Boards              | D           | 50            | U                       | NHH                      | 0                     | 0.004                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Signal Boards              | D           | 120           | U                       | NHH                      | 14                    | 0.153                  | 0.000                  | 0.000                  | 3                   | 4                 |  |
| Construction and Mining Equipment | Signal Boards              | D           | 175           | U                       | NHH                      | 17                    | 0.183                  | 0.000                  | 0.000                  | 2                   | 2                 |  |
| Construction and Mining Equipment | Signal Boards              | D           | 250           | U                       | NHH                      | 6                     | 0.064                  | 0.000                  | 0.000                  | 0                   | 1                 |  |
| Construction and Mining Equipment | Skid Steer Loaders         | G4          | 15            | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 1                   | 0                 |  |
| Construction and Mining Equipment | Skid Steer Loaders         | G4          | 25            | U                       | NHH                      | 33                    | 0.153                  | 0.000                  | 0.000                  | 33                  | 29                |  |
| Construction and Mining Equipment | Skid Steer Loaders         | G4          | 50            | U                       | NHH                      | 7                     | 0.059                  | 0.000                  | 0.000                  | 4                   | 4                 |  |
| Construction and Mining Equipment | Skid Steer Loaders         | G4          | 120           | U                       | NHH                      | 9                     | 0.088                  | 0.000                  | 0.000                  | 3                   | 2                 |  |
| Construction and Mining Equipment | Skid Steer Loaders         | D           | 25            | U                       | NHH                      | 31                    | 0.344                  | 0.000                  | 0.000                  | 22                  | 50                |  |
| Construction and Mining Equipment | Skid Steer Loaders         | D           | 50            | U                       | NHH                      | 535                   | 5.854                  | 0.000                  | 0.000                  | 198                 | 459               |  |
| Construction and Mining Equipment | Skid Steer Loaders         | D           | 120           | U                       | NHH                      | 468                   | 5.140                  | 0.000                  | 0.000                  | 104                 | 241               |  |
| Construction and Mining Equipment | Surfacing Equipment        | G4          | 5             | U                       | NHH                      | 1                     | 0.008                  | 0.000                  | 0.000                  | 12                  | 7                 |  |
| Construction and Mining Equipment | Surfacing Equipment        | G4          | 15            | U                       | NHH                      | 19                    | 0.092                  | 0.000                  | 0.000                  | 36                  | 50                |  |
| Construction and Mining Equipment | Surfacing Equipment        | G4          | 25            | U                       | NHH                      | 1                     | 0.003                  | 0.000                  | 0.000                  | 0                   | 1                 |  |
| Construction and Mining Equipment | Surfacing Equipment        | D           | 50            | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Surfacing Equipment        | D           | 120           | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Surfacing Equipment        | D           | 175           | U                       | NHH                      | 0                     | 0.002                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Surfacing Equipment        | D           | 250           | U                       | NHH                      | 1                     | 0.006                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Surfacing Equipment        | D           | 500           | U                       | NHH                      | 7                     | 0.077                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Surfacing Equipment        | D           | 750           | U                       | NHH                      | 7                     | 0.079                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Construction and Mining Equipment | Tampers/Rammers            | G2          | 15            | U                       | NHH                      | 3                     | 0.014                  | 0.000                  | 0.000                  | 28                  | 14                |  |
| Construction and Mining Equipment | Tampers/Rammers            | G4          | 15            | U                       | NHH                      | 0                     | 0.001                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | G4          | 120           | U                       | NHH                      | 4                     | 0.035                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | D           | 25            | U                       | NHH                      | 6                     | 0.066                  | 0.000                  | 0.000                  | 3                   | 8                 |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | D           | 50            | U                       | NHH                      | 69                    | 0.758                  | 0.000                  | 0.000                  | 19                  | 50                |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | D           | 120           | U                       | NHH                      | 1,576                 | 17.290                 | 0.001                  | 0.000                  | 257                 | 669               |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | D           | 175           | U                       | NHH                      | 230                   | 2.529                  | 0.000                  | 0.000                  | 19                  | 50                |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | D           | 250           | U                       | NHH                      | 125                   | 1.386                  | 0.000                  | 0.000                  | 6                   | 16                |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | D           | 500           | U                       | NHH                      | 406                   | 4.490                  | 0.000                  | 0.000                  | 10                  | 26                |  |
| Construction and Mining Equipment | Tractors/Loaders/Backhoes  | D           | 750           | U                       | NHH                      | 455                   | 5.027                  | 0.000                  | 0.000                  | 7                   | 19                |  |
| Construction and Mining Equipment | Trenchers                  | G4          | 15            | U                       | NHH                      | 8                     | 0.037                  | 0.000                  | 0.000                  | 10                  | 12                |  |
| Construction and Mining Equipment | Trenchers                  | G4          | 25            | U                       | NHH                      | 13                    | 0.059                  | 0.000                  | 0.000                  | 8                   | 9                 |  |
| Construction and Mining Equipment | Trenchers                  | G4          | 50            | U                       | NHH                      | 7                     | 0.055                  | 0.000                  | 0.000                  | 3                   | 3                 |  |
| Construction and Mining Equipment | Trenchers                  | G4          | 120           | U                       | NHH                      | 4                     | 0.040                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Trenchers                  | D           | 15            | U                       | NHH                      | 1                     | 0.006                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Trenchers                  | D           | 25            | U                       | NHH                      | 2                     | 0.025                  | 0.000                  | 0.000                  | 1                   | 2                 |  |
| Construction and Mining Equipment | Trenchers                  | D           | 50            | U                       | NHH                      | 88                    | 0.961                  | 0.000                  | 0.000                  | 34                  | 58                |  |
| Construction and Mining Equipment | Trenchers                  | D           | 120           | U                       | NHH                      | 234                   | 2.567                  | 0.000                  | 0.000                  | 46                  | 79                |  |
| Construction and Mining Equipment | Trenchers                  | D           | 175           | U                       | NHH                      | 57                    | 0.623                  | 0.000                  | 0.000                  | 5                   | 9                 |  |
| Construction and Mining Equipment | Trenchers                  | D           | 250           | U                       | NHH                      | 8                     | 0.087                  | 0.000                  | 0.000                  | 0                   | 1                 |  |
| Construction and Mining Equipment | Trenchers                  | D           | 500           | U                       | NHH                      | 14                    | 0.154                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Construction and Mining Equipment | Trenchers                  | D           | 750           | U                       | NHH                      | 3                     | 0.037                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Compressor (Dredging)      | D           | 50            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Compressor (Dredging)      | D           | 120           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Compressor (Dredging)      | D           | 175           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Compressor (Dredging)      | D           | 250           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Compressor (Dredging)      | D           | 500           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Compressor (Dredging)      | D           | 1000          | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Crane (Dredging)           | D           | 750           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Deck/door engine           | D           | 250           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Dredger                    | D           | 175           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Dredger                    | D           | 250           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Dredger                    | D           | 750           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Dredger                    | D           | 9999          | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Generator (Dredging)       | D           | 50            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Generator (Dredging)       | D           | 120           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Generator (Dredging)       | D           | 175           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Generator (Dredging)       | D           | 250           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Generator (Dredging)       | D           | 500           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Generator (Dredging)       | D           | 750           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Generator (Dredging)       | D           | 9999          | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Hoist/swing/winch          | D           | 50            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Hoist/swing/winch          | D           | 120           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Hoist/swing/winch          | D           | 175           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Hoist/swing/winch          | D           | 250           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Hoist/swing/winch          | D           | 500           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Hoist/swing/winch          | D           | 750           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Hoist/swing/winch          | D           | 9999          | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Other (Dredging)           | D           | 120           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Other (Dredging)           | D           | 175           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Other (Dredging)           | D           | 250           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Other (Dredging)           | D           | 500           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Pump (Dredging)            | D           | 120           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Pump (Dredging)            | D           | 175           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Pump (Dredging)            | D           | 250           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Pump (Dredging)            | D           | 500           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Pump (Dredging)            | D           | 750           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Dredging                          | Pump (Dredging)            | D           | 9999          | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Entertainment Equipment           | Compressor (Entertainment) | D           | 120           | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Entertainment Equipment           | Generator (Entertainment)  | D           | 50            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Entertainment Equipment           | Generator (Entertainment)  | D           | 120           | U                       | NHH                      | 2                     | 0.024                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Entertainment Equipment           | Generator (Entertainment)  | D           | 175           | U                       | NHH                      | 3                     | 0.033                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Entertainment Equipment           | Generator (Entertainment)  | D           | 250           | U                       | NHH                      | 6                     | 0.068                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Entertainment Equipment           | Generator (Entertainment)  | D           | 500           | U                       | NHH                      | 13                    | 0.148                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Entertainment Equipment           | Generator (Entertainment)  | D           | 750           | U                       | NHH                      | 5                     | 0.051                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Entertainment Equipment           | Generator (Entertainment)  | D           | 9999          | U                       | NHH                      | 1                     | 0.013                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Industrial Equipment              | Aerial Lifts               | G4          | 15            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Industrial Equipment              | Aerial Lifts               | G4          | 25            | U                       | NHH                      | 2                     | 0.011                  | 0.000                  | 0.000                  | 3                   | 3                 |  |
| Industrial Equipment              | Aerial Lifts               | G4          | 50            | U                       | NHH                      | 5                     | 0.040                  | 0.000                  | 0.000                  | 3                   | 3                 |  |
| Industrial Equipment              | Aerial Lifts               | G4          | 120           | U                       | NHH                      | 9                     | 0.081                  | 0.000                  | 0.000                  | 3                   | 3                 |  |
| Industrial Equipment              | Aerial Lifts               | C4          | 15            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Industrial Equipment              | Aerial Lifts               | C4          | 25            | U                       | NHH                      | 3                     | 0.019                  | 0.000                  | 0.000                  | 3                   | 3                 |  |
| Industrial Equipment              | Aerial Lifts               | D           | 15            | U                       | NHH                      | 1                     | 0.007                  | 0.000                  | 0.000                  | 1                   | 2                 |  |
| Industrial Equipment              | Aerial Lifts               | D           | 25            | U                       | NHH                      | 1                     | 0.014                  | 0.000                  | 0.000                  | 2                   | 3                 |  |
| Industrial Equipment              | Aerial Lifts               | D           | 50            | U                       | NHH                      | 8                     | 0.088                  | 0.000                  | 0.000                  | 9                   | 9                 |  |
| Industrial Equipment              | Aerial Lifts               | D           | 120           | U                       | NHH                      | 14                    | 0.152                  | 0.000                  | 0.000                  | 8                   | 8                 |  |
| Industrial Equipment              | Aerial Lifts               | D           | 500           | U                       | NHH                      | 10                    | 0.109                  | 0.000                  | 0.000                  | 1                   | 1                 |  |
| Industrial Equipment              | Aerial Lifts               | D           | 750           | U                       | NHH                      | 1                     | 0.016                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Industrial Equipment              | Forklifts                  | G4          | 25            | U                       | NHH                      | 0                     | 0.000                  | 0.000                  | 0.000                  | 0                   | 0                 |  |
| Industrial Equipment              | Forklifts                  | G4          | 50            | U                       | NHH                      | 82                    | 0.542                  | 0.000                  | 0.000                  | 10                  | 51                |  |
| Industrial Equipment              | Forklifts                  | G4          | 120           | U                       |                          |                       |                        |                        |                        |                     |                   |  |



|                            |                                   | Engine         | Commercial or |                            | Fuel                        | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|----------------------------|-----------------------------------|----------------|---------------|----------------------------|-----------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
| Class of Equipment         | Equipment                         | Type<br>& Fuel | MaxHP         | Residential<br>Application | Handheld or<br>Non-handheld |                           |                           |                           |                        |                      |  |
| Industrial Equipment       | Other General Industrial Equipmen | D              | 50            | U                          | NHH                         | 3                         | 0.035                     | 0.000                     | 0.000                  | 1                    | 3  |
| Industrial Equipment       | Other General Industrial Equipmen | D              | 120           | U                          | NHH                         | 37                        | 0.403                     | 0.000                     | 0.000                  | 3                    | 13   |
| Industrial Equipment       | Other General Industrial Equipmen | D              | 175           | U                          | NHH                         | 57                        | 0.624                     | 0.000                     | 0.000                  | 3                    | 13   |
| Industrial Equipment       | Other General Industrial Equipmen | D              | 250           | U                          | NHH                         | 79                        | 0.879                     | 0.000                     | 0.000                  | 3                    | 13   |
| Industrial Equipment       | Other General Industrial Equipmen | D              | 500           | U                          | NHH                         | 155                       | 1.717                     | 0.000                     | 0.000                  | 3                    | 13   |
| Industrial Equipment       | Other General Industrial Equipmen | D              | 750           | U                          | NHH                         | 64                        | 0.707                     | 0.000                     | 0.000                  | 1                    | 3  |
| Industrial Equipment       | Other General Industrial Equipmen | D              | 1000          | U                          | NHH                         | 50                        | 0.550                     | 0.000                     | 0.000                  | 1                    | 2  |
| Industrial Equipment       | Other Material Handling Equipment | G4             | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Industrial Equipment       | Other Material Handling Equipment | G4             | 120           | U                          | NHH                         | 2                         | 0.016                     | 0.000                     | 0.000                  | 1                    | 1  |
| Industrial Equipment       | Other Material Handling Equipment | D              | 50            | U                          | NHH                         | 0                         | 0.001                     | 0.000                     | 0.000                  | 0                    | 0  |
| Industrial Equipment       | Other Material Handling Equipment | D              | 120           | U                          | NHH                         | 1                         | 0.016                     | 0.000                     | 0.000                  | 0                    | 1  |
| Industrial Equipment       | Other Material Handling Equipment | D              | 175           | U                          | NHH                         | 3                         | 0.034                     | 0.000                     | 0.000                  | 0                    | 1  |
| Industrial Equipment       | Other Material Handling Equipment | D              | 250           | U                          | NHH                         | 9                         | 0.095                     | 0.000                     | 0.000                  | 0                    | 1  |
| Industrial Equipment       | Other Material Handling Equipment | D              | 500           | U                          | NHH                         | 2                         | 0.024                     | 0.000                     | 0.000                  | 0                    | 0  |
| Industrial Equipment       | Other Material Handling Equipment | D              | 9999          | U                          | NHH                         | 2                         | 0.027                     | 0.000                     | 0.000                  | 0                    | 0  |
| Industrial Equipment       | Sweepers/Scrubbers                | G4             | 15            | U                          | NHH                         | 1                         | 0.003                     | 0.000                     | 0.000                  | 2                    | 1  |
| Industrial Equipment       | Sweepers/Scrubbers                | G4             | 25            | U                          | NHH                         | 2                         | 0.008                     | 0.000                     | 0.000                  | 2                    | 1  |
| Industrial Equipment       | Sweepers/Scrubbers                | G4             | 50            | U                          | NHH                         | 11                        | 0.088                     | 0.000                     | 0.000                  | 3                    | 4  |
| Industrial Equipment       | Sweepers/Scrubbers                | G4             | 120           | U                          | NHH                         | 15                        | 0.140                     | 0.000                     | 0.000                  | 2                    | 3  |
| Industrial Equipment       | Sweepers/Scrubbers                | G4             | 175           | U                          | NHH                         | 0                         | 0.002                     | 0.000                     | 0.000                  | 0                    | 0  |
| Industrial Equipment       | Sweepers/Scrubbers                | D              | 15            | U                          | NHH                         | 0                         | 0.002                     | 0.000                     | 0.000                  | 0                    | 0  |
| Industrial Equipment       | Sweepers/Scrubbers                | D              | 25            | U                          | NHH                         | 0                         | 0.003                     | 0.000                     | 0.000                  | 0                    | 0  |
| Industrial Equipment       | Sweepers/Scrubbers                | D              | 50            | U                          | NHH                         | 18                        | 0.196                     | 0.000                     | 0.000                  | 4                    | 12   |
| Industrial Equipment       | Sweepers/Scrubbers                | D              | 120           | U                          | NHH                         | 70                        | 0.771                     | 0.000                     | 0.000                  | 6                    | 21   |
| Industrial Equipment       | Sweepers/Scrubbers                | D              | 175           | U                          | NHH                         | 60                        | 0.657                     | 0.000                     | 0.000                  | 3                    | 9  |
| Industrial Equipment       | Sweepers/Scrubbers                | D              | 250           | U                          | NHH                         | 11                        | 0.123                     | 0.000                     | 0.000                  | 0                    | 2  |
| Lawn and Garden Equipment  | Chainsaws                         | G2             | 2             | C                          | HH                          | 20                        | 0.081                     | 0.001                     | 0.000                  | 420                  | 333  |
| Lawn and Garden Equipment  | Chainsaws                         | G2             | 2             | R                          | HH                          | 3                         | 0.015                     | 0.000                     | 0.000                  | 4,721                | 63   |
| Lawn and Garden Equipment  | Chainsaws                         | G2             | 15            | C                          | HH                          | 34                        | 0.138                     | 0.002                     | 0.000                  | 296                  | 234  |
| Lawn and Garden Equipment  | Chainsaws                         | G2             | 15            | R                          | HH                          | 5                         | 0.026                     | 0.000                     | 0.000                  | 3,326                | 45   |
| Lawn and Garden Equipment  | Chainsaws Preempt                 | G2             | 15            | C                          | HH                          | 42                        | 0.172                     | 0.002                     | 0.000                  | 368                  | 292  |
| Lawn and Garden Equipment  | Chainsaws Preempt                 | G2             | 15            | R                          | HH                          | 6                         | 0.033                     | 0.000                     | 0.000                  | 4,140                | 56   |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | G4             | 15            | C                          | NHH                         | 2                         | 0.009                     | 0.000                     | 0.000                  | 1                    | 2  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | G4             | 15            | R                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 1                    | 0  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | G4             | 25            | C                          | NHH                         | 19                        | 0.086                     | 0.000                     | 0.000                  | 4                    | 13   |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | G4             | 25            | R                          | NHH                         | 0                         | 0.002                     | 0.000                     | 0.000                  | 7                    | 0  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | D              | 25            | U                          | NHH                         | 0                         | 0.001                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | D              | 120           | U                          | NHH                         | 6                         | 0.071                     | 0.000                     | 0.000                  | 1                    | 2  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | D              | 175           | U                          | NHH                         | 1                         | 0.008                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | D              | 250           | U                          | NHH                         | 0                         | 0.003                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | D              | 500           | U                          | NHH                         | 3                         | 0.034                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | D              | 750           | U                          | NHH                         | 8                         | 0.094                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Chippers/Stump Grinders           | D              | 1000          | U                          | NHH                         | 23                        | 0.254                     | 0.000                     | 0.000                  | 0                    | 1  |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | G2             | 15            | C                          | NHH                         | 5                         | 0.026                     | 0.000                     | 0.000                  | 5                    | 12   |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | G2             | 25            | C                          | NHH                         | 5                         | 0.027                     | 0.000                     | 0.000                  | 3                    | 6  |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | G4             | 15            | C                          | NHH                         | 58                        | 0.281                     | 0.000                     | 0.000                  | 49                   | 108  |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | G4             | 25            | C                          | NHH                         | 51                        | 0.239                     | 0.000                     | 0.000                  | 24                   | 53   |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | G4             | 50            | U                          | NHH                         | 33                        | 0.238                     | 0.000                     | 0.000                  | 10                   | 20   |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | G4             | 120           | U                          | NHH                         | 0                         | 0.003                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | D              | 15            | U                          | NHH                         | 4                         | 0.040                     | 0.000                     | 0.000                  | 3                    | 8  |
| Lawn and Garden Equipment  | Commercial Turf Equipment         | D              | 25            | U                          | NHH                         | 104                       | 1.139                     | 0.000                     | 0.000                  | 54                   | 157  |
| Lawn and Garden Equipment  | Front Mowers                      | G4             | 15            | C                          | NHH                         | 14                        | 0.067                     | 0.000                     | 0.000                  | 35                   | 26   |
| Lawn and Garden Equipment  | Front Mowers                      | G4             | 15            | R                          | NHH                         | 46                        | 0.225                     | 0.000                     | 0.000                  | 1,126                | 87   |
| Lawn and Garden Equipment  | Front Mowers                      | G4             | 25            | C                          | NHH                         | 15                        | 0.069                     | 0.000                     | 0.000                  | 27                   | 20   |
| Lawn and Garden Equipment  | Front Mowers                      | G4             | 25            | R                          | NHH                         | 49                        | 0.230                     | 0.000                     | 0.000                  | 882                  | 68   |
| Lawn and Garden Equipment  | Lawn & Garden Tractors            | G4             | 15            | C                          | NHH                         | 31                        | 0.153                     | 0.000                     | 0.000                  | 139                  | 49   |
| Lawn and Garden Equipment  | Lawn & Garden Tractors            | G4             | 15            | R                          | NHH                         | 23                        | 0.113                     | 0.000                     | 0.000                  | 905                  | 36   |
| Lawn and Garden Equipment  | Lawn & Garden Tractors            | G4             | 25            | C                          | NHH                         | 20                        | 0.093                     | 0.000                     | 0.000                  | 55                   | 19   |
| Lawn and Garden Equipment  | Lawn & Garden Tractors            | G4             | 25            | R                          | NHH                         | 15                        | 0.069                     | 0.000                     | 0.000                  | 357                  | 14   |
| Lawn and Garden Equipment  | Lawn & Garden Tractors            | G4             | 50            | U                          | NHH                         | 0                         | 0.003                     | 0.000                     | 0.000                  | 1                    | 0  |
| Lawn and Garden Equipment  | Lawn & Garden Tractors            | D              | 15            | U                          | NHH                         | 72                        | 0.786                     | 0.000                     | 0.000                  | 114                  | 169  |
| Lawn and Garden Equipment  | Lawn & Garden Tractors            | D              | 25            | U                          | NHH                         | 86                        | 0.947                     | 0.000                     | 0.000                  | 89                   | 133  |
| Lawn and Garden Equipment  | Lawn Mowers                       | G2             | 15            | C                          | NHH                         | 17                        | 0.100                     | 0.000                     | 0.000                  | 234                  | 147  |
| Lawn and Garden Equipment  | Lawn Mowers                       | G2             | 15            | R                          | NHH                         | 9                         | 0.051                     | 0.000                     | 0.000                  | 1,760                | 75   |
| Lawn and Garden Equipment  | Lawn Mowers                       | G4             | 5             | C                          | NHH                         | 105                       | 0.592                     | 0.001                     | 0.001                  | 1,388                | 869  |
| Lawn and Garden Equipment  | Lawn Mowers                       | G4             | 5             | R                          | NHH                         | 124                       | 0.637                     | 0.001                     | 0.001                  | 21,998               | 934  |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums              | G2             | 2             | C                          | HH                          | 59                        | 0.260                     | 0.003                     | 0.000                  | 2,044                | 1,099  |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums              | G2             | 2             | R                          | HH                          | 3                         | 0.016                     | 0.000                     | 0.000                  | 5,269                | 69   |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums              | G4             | 5             | C                          | NHH                         | 1                         | 0.004                     | 0.000                     | 0.000                  | 65                   | 11   |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums              | G4             | 5             | R                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 55                   | 1  |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums              | D              | 15            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums              | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Leaf Blowers/Vacuums              | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G2             | 2             | C                          | HH                          | 0                         | 0.000                     | 0.000                     | 0.000                  | 2                    | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G2             | 2             | R                          | HH                          | 0                         | 0.000                     | 0.000                     | 0.000                  | 71                   | 1  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G2             | 15            | C                          | HH                          | 0                         | 0.000                     | 0.000                     | 0.000                  | 1                    | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G2             | 15            | R                          | HH                          | 0                         | 0.000                     | 0.000                     | 0.000                  | 31                   | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 5             | C                          | NHH                         | 2                         | 0.009                     | 0.000                     | 0.000                  | 43                   | 8  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 5             | R                          | NHH                         | 4                         | 0.017                     | 0.000                     | 0.000                  | 1,327                | 16   |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 15            | C                          | NHH                         | 2                         | 0.008                     | 0.000                     | 0.000                  | 19                   | 4  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 15            | R                          | NHH                         | 3                         | 0.015                     | 0.000                     | 0.000                  | 589                  | 7  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 25            | C                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 25            | R                          | NHH                         | 0                         | 0.001                     | 0.000                     | 0.000                  | 13                   | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | G4             | 120           | U                          | NHH                         | 0                         | 0.001                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | D              | 15            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Other Lawn & Garden Equipment     | D              | 25            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers         | G4             | 15            | C                          | NHH                         | 188                       | 0.914                     | 0.000                     | 0.001                  | 760                  | 565  |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers         | G4             | 15            | R                          | NHH                         | 17                        | 0.083                     | 0.000                     | 0.000                  | 666                  | 51   |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers         | G4             | 25            | C                          | NHH                         | 2                         | 0.008                     | 0.000                     | 0.000                  | 3                    | 3  |
| Lawn and Garden Equipment  | Rear Engine Riding Mowers         | G4             | 25            | R                          | NHH                         | 0                         | 0.001                     | 0.000                     | 0.000                  | 3                    | 0  |
| Lawn and Garden Equipment  | Shredders                         | G2             | 15            | C                          | NHH                         | 2                         | 0.009                     | 0.000                     | 0.000                  | 10                   | 4  |
| Lawn and Garden Equipment  | Shredders                         | G2             | 15            | R                          | NHH                         | 0                         | 0.002                     | 0.000                     | 0.000                  | 368                  | 1  |
| Lawn and Garden Equipment  | Shredders                         | G4             | 5             | C                          | NHH                         | 3                         | 0.015                     | 0.000                     | 0.000                  | 27                   | 10   |
| Lawn and Garden Equipment  | Shredders                         | G4             | 5             | R                          | NHH                         | 1                         | 0.004                     | 0.000                     | 0.000                  | 1,017                | 3  |
| Lawn and Garden Equipment  | Snowblowers                       | G2             | 15            | C                          | HH                          | 0                         | 0.002                     | 0.000                     | 0.000                  | 16                   | 2  |
| Lawn and Garden Equipment  | Snowblowers                       | G2             | 15            | R                          | HH                          | 0                         | 0.001                     | 0.000                     | 0.000                  | 147                  | 1  |
| Lawn and Garden Equipment  | Snowblowers                       | G2             | 25            | C                          | HH                          | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Snowblowers                       | G2             | 25            | R                          | HH                          | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Snowblowers                       | G4             | 5             | C                          | NHH                         | 3                         | 0.014                     | 0.000                     | 0.000                  | 176                  | 21   |
| Lawn and Garden Equipment  | Snowblowers                       | G4             | 5             | R                          | NHH                         | 1                         | 0.005                     | 0.000                     | 0.000                  | 1,589                | 8  |
| Lawn and Garden Equipment  | Snowblowers                       | G4             | 15            | C                          | NHH                         | 5                         | 0.024                     | 0.000                     | 0.000                  | 134                  | 16   |
| Lawn and Garden Equipment  | Snowblowers                       | G4             | 15            | R                          | NHH                         | 2                         | 0.009                     | 0.000                     | 0.000                  | 1,202                | 6  |
| Lawn and Garden Equipment  | Snowblowers                       | G4             | 25            | C                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Snowblowers                       | G4             | 25            | R                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0.000                  | 3                    | 0  |
| Lawn and Garden Equipment  | Snowblowers                       | D              | 175           | U                          | NHH                         | 0                         | 0.003                     | 0.000                     | 0.000                  | 0                    | 0  |
| Lawn and Garden Equipment  | Snowblowers                       | D              | 250           | U                          | NHH                         | 8                         | 0.085                     | 0.000                     | 0.000                  | 1                    | 1  |
| Lawn and Garden Equipment  | Snowblowers                       | D              | 500           | U                          | NHH                         | 34                        | 0.378                     | 0.000                     | 0.000                  | 2                    | 3  |
| Lawn and Garden Equipment  | Tillers                           | G4             | 5             | C                          | NHH                         | 3                         | 0.017                     | 0.000                     | 0.000                  | 144                  | 22   |
| Lawn and Garden Equipment  | Tillers                           | G4             | 5             | R                          | NHH                         | 4                         | 0.021                     | 0.000                     | 0.000                  | 559                  | 28   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters     | G2             | 2             | C                          | HH                          | 20                        | 0.097                     | 0.001                     | 0.000                  | 1,368                | 455  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters     | G2             | 2             | R                          | HH                          | 38                        | 0.191                     | 0.001                     | 0.000                  | 15,254               | 898  |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters     | G4             | 5             | C                          | NHH                         | 3                         | 0.016                     | 0.000                     | 0.000                  | 253                  | 94   |
| Lawn and Garden Equipment  | Trimmers/Edgers/Brush Cutters     | G4             | 5             | R                          | NHH                         | 2                         | 0.012                     | 0.000                     | 0.000                  | 1,180                | 70   |
| Lawn and Garden Equipment  | Wood Splitters                    | G4             | 5             | C                          | NHH                         | 5                         | 0.027                     | 0.000                     | 0.000                  | 47                   | 16   |
| Lawn and Garden Equipment  | Wood Splitters                    | G4             | 5             | R                          | NHH                         | 1                         | 0.006                     | 0.000                     | 0.000                  | 1,169                | 4  |
| Light Commercial Equipment | Air Compressors                   | G4             | 5             | C                          | NHH                         | 10                        | 0.059                     | 0.000                     | 0.000                  | 29                   | 45   |
| Light Commercial Equipment | Air Compressors                   | G4             | 5             | R                          | NHH                         | 5                         | 0.031                     | 0.000                     | 0.000                  | 23                   | 24   |
| Light Commercial Equipment | Air Compressors                   | G4             | 15            | C                          | NHH                         | 9                         | 0.042                     | 0.000                     | 0.000                  | 15                   | 23   |
| Light Commercial Equipment | Air Compressors                   | G4             | 15            | R                          | NHH                         | 5                         | 0.022                     | 0.000                     | 0.000                  | 11                   | 12   |
| Light Commercial Equipment | Air Compressors                   | G4             | 25            | C                          | NHH                         | 3                         | 0.014                     | 0.000                     | 0.000                  | 2                    | 3  |
| Light Commercial Equipment | Air Compressors                   | G4             | 25            | R                          | NHH                         | 2                         | 0.007                     | 0.000                     | 0.000                  | 2                    | 2  |
| Light Commercial Equipment | Air Compressors                   | G4             | 50            | U                          | NHH                         | 10                        | 0.075                     | 0.000                     | 0.000                  | 3                    | 4  |
| Light Commercial Equipment | Air Compressors                   | G4             | 120           | U                          | NHH                         | 54                        | 0.482                     | 0.000                     | 0.000                  | 11                   | 14   |
| Light Commercial Equipment | Air Compressors                   | G4             | 175           | U                          | NHH                         | 7                         | 0                         |                           |                        |                      |  |

| Class of Equipment              | Equipment                        | Engine         | Commercial or              |                             | Fuel                     | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|---------------------------------|----------------------------------|----------------|----------------------------|-----------------------------|--------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
|                                 |                                  | Type<br>& Fuel | Residential<br>Application | Handheld or<br>Non-handheld | Consumption<br>(gal/day) |                           |                           |                           |                        |                      |  |
| Light Commercial Equipment      | Generator Sets                   | G2 2           | R                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 13                     | 3                    |  |
| Light Commercial Equipment      | Generator Sets                   | G2 15          | C                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Generator Sets                   | G2 15          | R                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Generator Sets                   | G4 5           | C                          | NHH                         | 18                       | 0.106                     | 0.000                     | 0.000                     | 225                    | 83                   |  |
| Light Commercial Equipment      | Generator Sets                   | G4 5           | R                          | NHH                         | 10                       | 0.056                     | 0.000                     | 0.000                     | 176                    | 44                   |  |
| Light Commercial Equipment      | Generator Sets                   | G4 15          | C                          | NHH                         | 136                      | 0.657                     | 0.000                     | 0.001                     | 617                    | 227                  |  |
| Light Commercial Equipment      | Generator Sets                   | G4 15          | R                          | NHH                         | 72                       | 0.347                     | 0.000                     | 0.000                     | 485                    | 120                  |  |
| Light Commercial Equipment      | Generator Sets                   | G4 25          | C                          | NHH                         | 158                      | 0.746                     | 0.000                     | 0.000                     | 331                    | 122                  |  |
| Light Commercial Equipment      | Generator Sets                   | G4 25          | R                          | NHH                         | 84                       | 0.394                     | 0.000                     | 0.000                     | 260                    | 64                   |  |
| Light Commercial Equipment      | Generator Sets                   | G4 50          | U                          | NHH                         | 77                       | 0.652                     | 0.000                     | 0.000                     | 110                    | 35                   |  |
| Light Commercial Equipment      | Generator Sets                   | G4 120         | U                          | NHH                         | 35                       | 0.323                     | 0.000                     | 0.000                     | 21                     | 7                    |  |
| Light Commercial Equipment      | Generator Sets                   | G4 175         | U                          | NHH                         | 6                        | 0.052                     | 0.000                     | 0.000                     | 2                      | 1                    |  |
| Light Commercial Equipment      | Generator Sets                   | C4 120         | U                          | NHH                         | 3                        | 0.021                     | 0.000                     | 0.000                     | 2                      | 0                    |  |
| Light Commercial Equipment      | Generator Sets                   | C4 175         | U                          | NHH                         | 5                        | 0.031                     | 0.000                     | 0.000                     | 1                      | 0                    |  |
| Light Commercial Equipment      | Generator Sets                   | D 15           | U                          | NHH                         | 18                       | 0.192                     | 0.000                     | 0.000                     | 41                     | 38                   |  |
| Light Commercial Equipment      | Generator Sets                   | D 25           | U                          | NHH                         | 22                       | 0.242                     | 0.000                     | 0.000                     | 30                     | 28                   |  |
| Light Commercial Equipment      | Generator Sets                   | D 50           | U                          | NHH                         | 47                       | 0.514                     | 0.000                     | 0.000                     | 36                     | 34                   |  |
| Light Commercial Equipment      | Generator Sets                   | D 120          | U                          | NHH                         | 181                      | 1.987                     | 0.000                     | 0.000                     | 55                     | 51                   |  |
| Light Commercial Equipment      | Generator Sets                   | D 175          | U                          | NHH                         | 19                       | 0.214                     | 0.000                     | 0.000                     | 3                      | 3                    |  |
| Light Commercial Equipment      | Generator Sets                   | D 250          | U                          | NHH                         | 16                       | 0.179                     | 0.000                     | 0.000                     | 2                      | 2                    |  |
| Light Commercial Equipment      | Generator Sets                   | D 500          | U                          | NHH                         | 57                       | 0.631                     | 0.000                     | 0.000                     | 4                      | 4                    |  |
| Light Commercial Equipment      | Generator Sets                   | D 750          | U                          | NHH                         | 57                       | 0.633                     | 0.000                     | 0.000                     | 3                      | 2                    |  |
| Light Commercial Equipment      | Generator Sets                   | D 9999         | U                          | NHH                         | 29                       | 0.318                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Light Commercial Equipment      | Pressure Washers                 | G4 5           | C                          | NHH                         | 8                        | 0.045                     | 0.000                     | 0.000                     | 60                     | 22                   |  |
| Light Commercial Equipment      | Pressure Washers                 | G4 5           | R                          | NHH                         | 4                        | 0.024                     | 0.000                     | 0.000                     | 47                     | 12                   |  |
| Light Commercial Equipment      | Pressure Washers                 | G4 15          | C                          | NHH                         | 12                       | 0.056                     | 0.000                     | 0.000                     | 54                     | 20                   |  |
| Light Commercial Equipment      | Pressure Washers                 | G4 15          | R                          | NHH                         | 6                        | 0.029                     | 0.000                     | 0.000                     | 42                     | 10                   |  |
| Light Commercial Equipment      | Pressure Washers                 | G4 25          | C                          | NHH                         | 6                        | 0.027                     | 0.000                     | 0.000                     | 10                     | 4                    |  |
| Light Commercial Equipment      | Pressure Washers                 | G4 25          | R                          | NHH                         | 3                        | 0.014                     | 0.000                     | 0.000                     | 8                      | 2                    |  |
| Light Commercial Equipment      | Pressure Washers                 | G4 50          | U                          | NHH                         | 1                        | 0.007                     | 0.000                     | 0.000                     | 1                      | 0                    |  |
| Light Commercial Equipment      | Pressure Washers                 | D 15           | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 2                      | 1                    |  |
| Light Commercial Equipment      | Pressure Washers                 | D 25           | U                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pressure Washers                 | D 50           | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 1                      | 0                    |  |
| Light Commercial Equipment      | Pressure Washers                 | D 120          | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps                            | G2 2           | C                          | NHH                         | 2                        | 0.016                     | 0.000                     | 0.000                     | 68                     | 48                   |  |
| Light Commercial Equipment      | Pumps                            | G2 2           | R                          | NHH                         | 1                        | 0.008                     | 0.000                     | 0.000                     | 53                     | 25                   |  |
| Light Commercial Equipment      | Pumps                            | G2 15          | C                          | NHH                         | 7                        | 0.034                     | 0.000                     | 0.000                     | 18                     | 13                   |  |
| Light Commercial Equipment      | Pumps                            | G2 15          | R                          | NHH                         | 3                        | 0.018                     | 0.000                     | 0.000                     | 14                     | 7                    |  |
| Light Commercial Equipment      | Pumps                            | G2 25          | C                          | NHH                         | 0                        | 0.001                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps                            | G2 25          | R                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps                            | G4 5           | C                          | NHH                         | 9                        | 0.055                     | 0.000                     | 0.000                     | 80                     | 56                   |  |
| Light Commercial Equipment      | Pumps                            | G4 5           | R                          | NHH                         | 5                        | 0.029                     | 0.000                     | 0.000                     | 63                     | 30                   |  |
| Light Commercial Equipment      | Pumps                            | G4 15          | C                          | NHH                         | 33                       | 0.159                     | 0.000                     | 0.000                     | 86                     | 61                   |  |
| Light Commercial Equipment      | Pumps                            | G4 15          | R                          | NHH                         | 18                       | 0.084                     | 0.000                     | 0.000                     | 68                     | 32                   |  |
| Light Commercial Equipment      | Pumps                            | G4 25          | C                          | NHH                         | 19                       | 0.087                     | 0.000                     | 0.000                     | 22                     | 16                   |  |
| Light Commercial Equipment      | Pumps                            | G4 25          | R                          | NHH                         | 10                       | 0.046                     | 0.000                     | 0.000                     | 17                     | 8                    |  |
| Light Commercial Equipment      | Pumps                            | G4 50          | U                          | NHH                         | 12                       | 0.098                     | 0.000                     | 0.000                     | 9                      | 5                    |  |
| Light Commercial Equipment      | Pumps                            | G4 120         | U                          | NHH                         | 40                       | 0.370                     | 0.000                     | 0.000                     | 11                     | 7                    |  |
| Light Commercial Equipment      | Pumps                            | G4 175         | U                          | NHH                         | 2                        | 0.017                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps                            | D 15           | U                          | NHH                         | 11                       | 0.125                     | 0.000                     | 0.000                     | 31                     | 34                   |  |
| Light Commercial Equipment      | Pumps                            | D 25           | U                          | NHH                         | 9                        | 0.098                     | 0.000                     | 0.000                     | 9                      | 10                   |  |
| Light Commercial Equipment      | Pumps                            | D 50           | U                          | NHH                         | 27                       | 0.301                     | 0.000                     | 0.000                     | 16                     | 18                   |  |
| Light Commercial Equipment      | Pumps                            | D 120          | U                          | NHH                         | 122                      | 1.339                     | 0.000                     | 0.000                     | 31                     | 34                   |  |
| Light Commercial Equipment      | Pumps                            | D 175          | U                          | NHH                         | 24                       | 0.260                     | 0.000                     | 0.000                     | 3                      | 4                    |  |
| Light Commercial Equipment      | Pumps                            | D 250          | U                          | NHH                         | 24                       | 0.270                     | 0.000                     | 0.000                     | 2                      | 3                    |  |
| Light Commercial Equipment      | Pumps                            | D 500          | U                          | NHH                         | 1                        | 0.009                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps                            | D 750          | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Pumps                            | D 9999         | U                          | NHH                         | 12                       | 0.131                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Welders                          | G4 15          | C                          | NHH                         | 18                       | 0.085                     | 0.000                     | 0.000                     | 56                     | 32                   |  |
| Light Commercial Equipment      | Welders                          | G4 25          | C                          | NHH                         | 102                      | 0.475                     | 0.000                     | 0.000                     | 203                    | 116                  |  |
| Light Commercial Equipment      | Welders                          | G4 50          | U                          | NHH                         | 24                       | 0.198                     | 0.000                     | 0.000                     | 18                     | 10                   |  |
| Light Commercial Equipment      | Welders                          | G4 120         | U                          | NHH                         | 34                       | 0.310                     | 0.000                     | 0.000                     | 18                     | 10                   |  |
| Light Commercial Equipment      | Welders                          | G4 175         | U                          | NHH                         | 4                        | 0.039                     | 0.000                     | 0.000                     | 1                      | 1                    |  |
| Light Commercial Equipment      | Welders                          | D 15           | U                          | NHH                         | 7                        | 0.075                     | 0.000                     | 0.000                     | 14                     | 24                   |  |
| Light Commercial Equipment      | Welders                          | D 25           | U                          | NHH                         | 11                       | 0.121                     | 0.000                     | 0.000                     | 12                     | 21                   |  |
| Light Commercial Equipment      | Welders                          | D 50           | U                          | NHH                         | 78                       | 0.853                     | 0.000                     | 0.000                     | 37                     | 66                   |  |
| Light Commercial Equipment      | Welders                          | D 120          | U                          | NHH                         | 92                       | 1.008                     | 0.000                     | 0.000                     | 29                     | 51                   |  |
| Light Commercial Equipment      | Welders                          | D 175          | U                          | NHH                         | 1                        | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Welders                          | D 250          | U                          | NHH                         | 0                        | 0.003                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Light Commercial Equipment      | Welders                          | D 500          | U                          | NHH                         | 1                        | 0.012                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Logging Equipment               | Chainsaws                        | G2 15          | U                          | HH                          | 358                      | 1.515                     | 0.017                     | 0.001                     | 770                    | 435                  |  |
| Logging Equipment               | Fellers/Bunchers                 | D 120          | U                          | NHH                         | 1,427                    | 15.666                    | 0.001                     | 0.000                     | 98                     | 342                  |  |
| Logging Equipment               | Fellers/Bunchers                 | D 175          | U                          | NHH                         | 2,601                    | 28.595                    | 0.001                     | 0.000                     | 121                    | 423                  |  |
| Logging Equipment               | Fellers/Bunchers                 | D 250          | U                          | NHH                         | 2,273                    | 25.137                    | 0.001                     | 0.000                     | 74                     | 258                  |  |
| Logging Equipment               | Fellers/Bunchers                 | D 500          | U                          | NHH                         | 1,003                    | 11.092                    | 0.000                     | 0.000                     | 22                     | 76                   |  |
| Logging Equipment               | Fellers/Bunchers                 | D 750          | U                          | NHH                         | 152                      | 1.681                     | 0.000                     | 0.000                     | 2                      | 6                    |  |
| Logging Equipment               | Shredders                        | G4 15          | U                          | NHH                         | 505                      | 2.429                     | 0.002                     | 0.002                     | 1,208                  | 802                  |  |
| Logging Equipment               | Shredders                        | D 175          | U                          | NHH                         | 0                        | 0.002                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Logging Equipment               | Skidders                         | D 120          | U                          | NHH                         | 766                      | 8.410                     | 0.000                     | 0.000                     | 45                     | 178                  |  |
| Logging Equipment               | Skidders                         | D 175          | U                          | NHH                         | 1,811                    | 19.911                    | 0.001                     | 0.000                     | 72                     | 284                  |  |
| Logging Equipment               | Skidders                         | D 250          | U                          | NHH                         | 996                      | 11.009                    | 0.000                     | 0.000                     | 26                     | 105                  |  |
| Logging Equipment               | Skidders                         | D 500          | U                          | NHH                         | 67                       | 0.737                     | 0.000                     | 0.000                     | 1                      | 6                    |  |
| Military Tactical Support Equip | A/C unit                         | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | A/C unit                         | D 250          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | A/C unit                         | D 500          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Aircraft Support                 | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Aircraft Support                 | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Cart                             | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Cart                             | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Cart                             | D 250          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Communications                   | D 50           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Communications                   | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Compressor (Military)            | D 50           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Compressor (Military)            | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Compressor (Military)            | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Compressor (Military)            | D 250          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Compressor (Military)            | D 500          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Crane                            | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Crane                            | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Crane                            | D 250          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Deicer                           | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Generator (Military)             | D 50           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Generator (Military)             | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Generator (Military)             | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Generator (Military)             | D 250          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Generator (Military)             | D 500          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Generator (Military)             | D 750          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Hydraulic unit                   | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Lift (Military)                  | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Light                            | D 50           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Other tactical support equipment | D 50           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Other tactical support equipment | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Other tactical support equipment | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Other tactical support equipment | D 250          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Other tactical support equipment | D 500          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Other tactical support equipment | D 750          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Pressure Washers                 | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Pump (Military)                  | D 50           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Pump (Military)                  | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Start Cart                       | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Start Cart                       | D 500          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Test Stand                       | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Test Stand                       | D 175          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Test Stand                       | D 250          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Test Stand                       | D 500          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Welder                           | D 50           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Military Tactical Support Equip | Welder                           | D 120          | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                    | Compressors (Workover)           | D 25           | U                          | NHH                         | 0                        | 0.000                     | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                    | Compressors (                    |                |                            |                             |                          |                           |                           |                           |                        |                      |  |

|                               |                                      | Engine         | Commercial or |                            | Fuel                        | CO2 Exhaust<br>(tons/day) | CH4 Exhaust<br>(tons/day) | N2O Exhaust<br>(tons/day) | Number of<br>Equipment | Activity<br>(hr/day) |  |
|-------------------------------|--------------------------------------|----------------|---------------|----------------------------|-----------------------------|---------------------------|---------------------------|---------------------------|------------------------|----------------------|--|
| Class of Equipment            | Equipment                            | Type<br>& Fuel | MaxHP         | Residential<br>Application | Handheld or<br>Non-handheld |                           |                           |                           |                        |                      |  |
| Oil Drilling                  | Drill Rig (Mobile)                   | D              | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Drill Rig (Mobile)                   | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Drill Rig (Mobile)                   | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Drill Rig (Mobile)                   | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Drill Rig (Mobile)                   | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Drill Rig (Mobile)                   | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Drill Rig (Mobile)                   | D              | 1000          | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Drilling)                 | D              | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Drilling)                 | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Drilling)                 | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Drilling)                 | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Drilling)                 | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Drilling)                 | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Workover)                 | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Workover)                 | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Workover)                 | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Workover)                 | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Workover)                 | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Generator (Workover)                 | D              | 9999          | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Lift (Drilling)                      | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Lift (Drilling)                      | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Lift (Drilling)                      | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Lift (Drilling)                      | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Lift (Drilling)                      | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Other Workover Equipment             | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Other Workover Equipment             | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Other Workover Equipment             | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Other Workover Equipment             | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Other Workover Equipment             | D              | 1000          | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pressure Washers                     | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Drilling)                      | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Drilling)                      | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Drilling)                      | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Drilling)                      | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Drilling)                      | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Drilling)                      | D              | 9999          | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Workover)                      | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Workover)                      | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Workover)                      | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Workover)                      | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Pump (Workover)                      | D              | 9999          | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Snubbing                             | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Swivel                               | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Swivel                               | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Swivel                               | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Swivel                               | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Workover Rig (Mobile)                | D              | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Workover Rig (Mobile)                | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Workover Rig (Mobile)                | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Workover Rig (Mobile)                | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Workover Rig (Mobile)                | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Workover Rig (Mobile)                | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Oil Drilling                  | Workover Rig (Mobile)                | D              | 1000          | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Other Portable Equipment      | Misc Portable Equipment              | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Other Portable Equipment      | Misc Portable Equipment              | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Other Portable Equipment      | Misc Portable Equipment              | D              | 250           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Other Portable Equipment      | Misc Portable Equipment              | D              | 500           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Other Portable Equipment      | Misc Portable Equipment              | D              | 750           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Other Portable Equipment      | Misc Portable Equipment              | D              | 1000          | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Pleasure Craft                | Personal Water Craft                 | G2             | 9999          | U                          | NHH                         | 21,836                    | 195.001                   | 0.147                     | 87,172                 | 5,872                |  |
| Pleasure Craft                | Sailboat Auxiliary Inboard Engine    | G4             | 15            | U                          | NHH                         | 1                         | 0.007                     | 0.000                     | 92                     | 3                    |  |
| Pleasure Craft                | Sailboat Auxiliary Inboard Engine    | D              | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 1                      | 0                    |  |
| Pleasure Craft                | Sailboat Auxiliary Outboard Engin    | G2             | 15            | U                          | NHH                         | 0                         | 0.002                     | 0.000                     | 60                     | 2                    |  |
| Pleasure Craft                | Sailboat Auxiliary Outboard Engin    | G2             | 25            | U                          | NHH                         | 0                         | 0.002                     | 0.000                     | 32                     | 1                    |  |
| Pleasure Craft                | Sailboat Auxiliary Outboard Engin    | G2             | 50            | U                          | NHH                         | 1                         | 0.007                     | 0.000                     | 30                     | 1                    |  |
| Pleasure Craft                | Vessels w/Inboard Engines            | G4             | 250           | U                          | NHH                         | 12,352                    | 96.009                    | 0.018                     | 8,919                  | 2,266                |  |
| Pleasure Craft                | Vessels w/Inboard Engines            | D              | 250           | U                          | NHH                         | 4                         | 0.044                     | 0.000                     | 3                      | 1                    |  |
| Pleasure Craft                | Vessels w/Inboard Jet Engines        | G4             | 500           | U                          | NHH                         | 1,776                     | 13.851                    | 0.002                     | 1,380                  | 275                  |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 2             | U                          | NHH                         | 1                         | 0.005                     | 0.000                     | 124                    | 16                   |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 15            | U                          | NHH                         | 110                       | 0.820                     | 0.002                     | 6,882                  | 903                  |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 25            | U                          | NHH                         | 94                        | 0.743                     | 0.001                     | 1,870                  | 245                  |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 50            | U                          | NHH                         | 277                       | 2.448                     | 0.002                     | 1,826                  | 239                  |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 120           | U                          | NHH                         | 513                       | 4.545                     | 0.004                     | 1,606                  | 211                  |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 175           | U                          | NHH                         | 425                       | 3.746                     | 0.003                     | 741                    | 97                   |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 250           | U                          | NHH                         | 158                       | 1.413                     | 0.001                     | 213                    | 28                   |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G2             | 500           | U                          | NHH                         | 46                        | 0.399                     | 0.000                     | 43                     | 6                    |  |
| Pleasure Craft                | Vessels w/Outboard Engines           | G4             | 50            | U                          | NHH                         | 115                       | 0.777                     | 0.000                     | 637                    | 84                   |  |
| Pleasure Craft                | Vessels w/Sterndrive Engines         | G4             | 250           | U                          | NHH                         | 14,515                    | 113.481                   | 0.020                     | 18,149                 | 3,620                |  |
| Railyard Operations           | Compressor (Railyard)                | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Railyard Operations           | Crane (Rail-CHE)                     | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Railyard Operations           | Crane (Rail-CHE)                     | D              | 175           | U                          | NHH                         | 0                         | 0.001                     | 0.000                     | 0                      | 0                    |  |
| Railyard Operations           | Generator (Railyard)                 | D              | 175           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Railyard Operations           | Generator (Railyard)                 | D              | 9999          | U                          | NHH                         | 0                         | 0.002                     | 0.000                     | 0                      | 0                    |  |
| Railyard Operations           | Materials Handling (Rail-CHE)        | D              | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 0                      | 0                    |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2             | 15            | U                          | NHH                         | 119                       | 0.397                     | 0.007                     | 847                    | 3,136                |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2             | 25            | U                          | NHH                         | 77                        | 0.259                     | 0.005                     | 551                    | 2,042                |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G2             | 50            | U                          | NHH                         | 102                       | 0.340                     | 0.006                     | 726                    | 2,687                |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4             | 15            | U                          | NHH                         | 48                        | 0.324                     | 0.000                     | 691                    | 2,559                |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4             | 25            | U                          | NHH                         | 673                       | 4.510                     | 0.003                     | 9,617                  | 35,607               |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Active   | G4             | 50            | U                          | NHH                         | 30                        | 0.204                     | 0.000                     | 434                    | 1,607                |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2             | 15            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 257                    | 952                  |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2             | 25            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 167                    | 620                  |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G2             | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 220                    | 816                  |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4             | 15            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 210                    | 777                  |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4             | 25            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 2,920                  | 10,809               |  |
| Recreational Equipment        | All Terrain Vehicles (ATVs) Inactive | G4             | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 132                    | 488                  |  |
| Recreational Equipment        | Golf Carts                           | G2             | 15            | U                          | NHH                         | 562                       | 2.924                     | 0.002                     | 494                    | 1,492                |  |
| Recreational Equipment        | Golf Carts                           | G4             | 15            | U                          | NHH                         | 474                       | 2.288                     | 0.001                     | 386                    | 1,168                |  |
| Recreational Equipment        | Minibikes                            | G4             | 5             | U                          | NHH                         | 15                        | 0.008                     | 0.001                     | 172                    | 65                   |  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2             | 15            | U                          | NHH                         | 81                        | 0.272                     | 0.005                     | 580                    | 2,148                |  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2             | 25            | U                          | NHH                         | 70                        | 0.234                     | 0.004                     | 499                    | 1,849                |  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2             | 50            | U                          | NHH                         | 570                       | 1.906                     | 0.036                     | 4,065                  | 15,049               |  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G2             | 120           | U                          | NHH                         | 273                       | 0.912                     | 0.017                     | 1,944                  | 7,199                |  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4             | 15            | U                          | NHH                         | 79                        | 0.531                     | 0.000                     | 1,132                  | 4,189                |  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4             | 25            | U                          | NHH                         | 127                       | 0.856                     | 0.001                     | 1,826                  | 6,759                |  |
| Recreational Equipment        | Off-Road Motorcycles Active          | G4             | 50            | U                          | NHH                         | 132                       | 0.892                     | 0.001                     | 1,902                  | 7,041                |  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2             | 15            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 232                    | 861                  |  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2             | 25            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 200                    | 741                  |  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2             | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 1,628                  | 6,028                |  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G2             | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 779                    | 2,884                |  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4             | 15            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 453                    | 1,678                |  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4             | 25            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 731                    | 2,707                |  |
| Recreational Equipment        | Off-Road Motorcycles Inactive        | G4             | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 762                    | 2,821                |  |
| Recreational Equipment        | Snowmobiles Active                   | G2             | 25            | U                          | NHH                         | 17                        | 0.077                     | 0.001                     | 153                    | 24                   |  |
| Recreational Equipment        | Snowmobiles Active                   | G2             | 50            | U                          | NHH                         | 154                       | 0.694                     | 0.005                     | 720                    | 113                  |  |
| Recreational Equipment        | Snowmobiles Active                   | G2             | 120           | U                          | NHH                         | 479                       | 2.158                     | 0.016                     | 1,309                  | 206                  |  |
| Recreational Equipment        | Snowmobiles Inactive                 | G2             | 25            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 53                     | 8                    |  |
| Recreational Equipment        | Snowmobiles Inactive                 | G2             | 50            | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 251                    | 39                   |  |
| Recreational Equipment        | Snowmobiles Inactive                 | G2             | 120           | U                          | NHH                         | 0                         | 0.000                     | 0.000                     | 456                    | 72                   |  |
| Recreational Equipment        | Specialty Vehicles Carts             | G2             | 15            | U                          | NHH                         | 75                        | 0.393                     | 0.000                     | 1,125                  | 205                  |  |
| Recreational Equipment        | Specialty Vehicles Carts             | G4             | 5             | U                          | NHH                         | 2                         | 0.009                     | 0.000                     | 35                     | 6                    |  |
| Recreational Equipment        | Specialty Vehicles Carts             | G4             | 15            | U                          | NHH                         | 34                        | 0.165                     | 0.000                     | 472                    | 86                   |  |
| Recreational Equipment        | Specialty Vehicles Carts             | G4             | 25            | U                          | NHH                         | 52                        | 0.246                     | 0.000                     | 259                    | 47                   |  |
| Transport Refrigeration Units | Transport Refrigeration Units        | G4             | 15            | U                          | NHH                         | 104                       | 0.505                     | 0.000                     | 86                     | 178                  |  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D              | 15            | U                          | NHH                         | 357                       | 3.906                     | 0.000                     | 342                    | 974                  |  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D              | 25            | U                          | NHH                         | 141                       | 1.545                     | 0.000                     | 80                     | 227                  |  |
| Transport Refrigeration Units | Transport Refrigeration Units        | D              | 50            | U                          | NHH                         | 14,260                    | 155.937                   | 0.011                     | 2,995                  | 12,043               |  |



|  | <u>CO2</u>   | <u>CH4</u>   | <u>N2O</u>                            | <u>units</u> | <u>source</u>                |
|--|--------------|--------------|---------------------------------------|--------------|------------------------------|
| Avg. daily emissions from Ag equipment in Shasta County  | 165          | 0            | 0                                     | tons/day     | wksht: Equip class processed |
| time conversion  | 365          | 365          | 365                                   | days/year    | 6.0 Unit Conversions.xlsx    |
| mass conversion  | 1.1023       | 1.1023       | 1.1023                                | ton/MT       | 6.0 Unit Conversions.xlsx    |
| Avg. daily emissions from Ag equipment in Shasta County  | 54,646       | 8.14         | 0.31                                  | MT/year      | conversion calculation       |
| global warming potential                                 | 1            | 21           | 310                                   | unitless     | 6.0 Unit Conversions.xlsx    |
|  |              |              |                                       |              |                              |
|  | <u>value</u> | <u>units</u> | <u>source</u>                         |              |                              |
| Total CO2-e emissions from Ag equipment in Shasta County | 54,912       | MT/year      | calculation                           |              |                              |
| Breakdown of Population in County, by Jurisdiction       |              |              |                                       |              |                              |
| Redding  | 90,353       | residents    | 4.0 Population in Base Year 2008.xlsx |              |                              |
| Anderson   | 10,561       | residents    | 4.0 Population in Base Year 2008.xlsx |              |                              |
| Shasta Lake  | 10,262       | residents    | 4.0 Population in Base Year 2008.xlsx |              |                              |
| Unincorporated County                                    | 70,777       | residents    | 4.0 Population in Base Year 2008.xlsx |              |                              |
| County Total   | 181,953      | residents    | 4.0 Population in Base Year 2008.xlsx |              |                              |
| Breakdown, percentage                                    |              |              |                                       |              |                              |
| Redding  | 50%          | %            | proration calculation                 |              |                              |
| Anderson   | 6%           | %            | proration calculation                 |              |                              |
| Shasta Lake  | 6%           | %            | proration calculation                 |              |                              |
| Unincorporated County                                    | 39%          | %            | proration calculation                 |              |                              |
| County Total   | 100%         | %            | summation                             |              |                              |
| Breakdown of CO2-e emissions by mass                     |              |              |                                       |              |                              |
| Redding  | 27,268       | MT/year      | calculation                           |              |                              |
| Anderson   | 3,187        | MT/year      | calculation                           |              |                              |
| Shasta Lake  | 3,097        | MT/year      | calculation                           |              |                              |
| Unincorporated County                                    | 21,360       | MT/year      | calculation                           |              |                              |
| County Total   | 54,912       | MT/year      | summation                             |              |                              |
|  |              |              |                                       |              |                              |
| Total Usage in County                                    | 3,476        | hr/day       | wksht: Equip class processed          |              |                              |
| Breakdown by Jurisdiction                                |              |              |                                       |              |                              |
| Redding  | 1,726        | hr/day       | calculation                           |              |                              |
| Anderson   | 202          | hr/day       | calculation                           |              |                              |
| Shasta Lake  | 196          | hr/day       | calculation                           |              |                              |
| Unincorporated County                                    | 1,352        | hr/day       | calculation                           |              |                              |
| County Total   | 3,476        | hr/day       | summation                             |              |                              |



# Shasta County 2008 Baseline Greenhouse Gas Emissions Inventory

## Executive Summary

4.0 Population in Base Year 2008.xlsx



### Population in Base Year 2008, by Jurisdiction

| <u>Jurisdiction</u>   | <u>Population</u> |
|-----------------------|-------------------|
| Redding               | 90,353            |
| Anderson              | 10,561            |
| Shasta Lake           | 10,262            |
| Unincorporated County | 70,777            |
| Total County          | 181,953           |

### Source: (Ref 36)

California Department of Finance. 2010 (May). E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark. Sacramento, CA. Available at:

<<http://www.dof.ca.gov/research/demographic/reports/estimates/e-4/2001-10/view.php>>.

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|             |  | Unincorporated Shasta County |                           |         |      | City of Anderson |                           |         |                | City of Redding                  |                           |               |                    | City of Shasta Lake          |                           |         |
|-------------|--|------------------------------|---------------------------|---------|------|------------------|---------------------------|---------|----------------|----------------------------------|---------------------------|---------------|--------------------|------------------------------|---------------------------|---------|
|             |  | Contacts/Information Sources | Input Data KWh and Therms | CO2e MT |      | Contacts/        | Input Data KWh and Therms | CO2e MT |                | Contacts/                        | Input Data KWh and Therms | CO2e MT       |                    | Contacts/Information Sources | Input Data KWh and Therms | CO2e MT |
| Residential | Electricity Consumption (kilowatt-hours) | PG&E                         | 290522247                 | 84471   | PG&E | 32022516         | 9311                      | REU     | 385,929,281.50 | Emission Factor = 0.297 tons/MWh | 68862                     | City of SL EU | See notes in email | See notes in email           |                           |         |
| Residential | Natural Gas Consumption (therms)         | PG&E                         | 3565367                   | 18922   | PG&E | 1506989          | 7998                      | PG&E    | 12975384       |                                  |                           | PG&E          | 1359680            | 7216                         |                           |         |
| Commercial  | Electricity Consumption (kilowatt-hours) | PG&E                         | 202680710                 | 58931   | PG&E | 29621541         | 8612                      | REU     | 393,368,104.50 | Emission Factor = 0.297 tons/MWh | 38271                     | City of SL EU | See notes in email | See notes in email           |                           |         |
| Commercial  | Natural Gas Consumption (therms)         | PG&E                         | 9808746                   | 52056   | PG&E | 630822           | 3348                      | PG&E    | 7211093        |                                  |                           | PG&E          | 4707635            | 24985                        |                           |         |
| Industrial  | Electricity Consumption (kilowatt-hours) | PG&E                         | -                         | -       | PG&E | -                | -                         | REU     | 18,728,700     | Emission Factor = 0.297 tons/MWh |                           | City of SL EU | See notes in email | See notes in email           |                           |         |
| Industrial  | Natural Gas Consumption (therms)         | PG&E                         | 296322                    | 1,573   | PG&E | -                | -                         | PG&E    | -              |                                  |                           | PG&E          | -                  | -                            |                           |         |
|             |  |                              |                           |         |      |                  |                           |         |                |                                  |                           | 2008          | 189214500          | See notes in email           |                           |         |



| Jurisdiction and Land Use    | Utility | Therms     | Emission Factor<br>(MT CO2-e/<br>MW-hr) | CO2-e Emissions<br>(MT/year) | Sources  | Notes                  |
|------------------------------|---------|------------|---|------------------------------|--|------------------------|
| Redding                      |         |            |   |                              |  |                        |
| Residential                  | PG&E    | 12,975,384 | 0.0053                                  | 68,862                       | wksht: raw data; calculations, and conversions | See Note 1             |
| Commercial                   | PG&E    | 7,211,093  | 0.0053                                  | 38,271                       | wksht: raw data; calculations, and conversions | See Note 1             |
| Industrial                   | PG&E    | —          | —                                       | —                            | wksht: raw data; calculations, and conversions | See Note 1             |
| Subtotal                     |         | 20,186,477 | 48                                      | 107,133                      | summation                                      |                        |
| Anderson                     |         |            |   |                              |  |                        |
| Residential                  | PG&E    | 1,506,989  | 0.0053                                  | 7,998                        | wksht: raw data; calculations, and conversions | See Note 1             |
| Commercial                   | PG&E    | 630,822    | 0.0053                                  | 3,348                        | wksht: raw data; calculations, and conversions | See Note 1; See Note 2 |
| Industrial                   | PG&E    | —          | —                                       | —                            | wksht: raw data; calculations, and conversions | See Note 2             |
| Subtotal                     |         | 2,137,811  | 5                                       | 11,346                       | summation                                      |                        |
| Shasta Lake                  |         |            |   |                              |  |                        |
| Residential                  | PG&E    | 1,359,680  | 0.0053                                  | 7,216                        | wksht: Shasta Lake detail; calculations        | See Note 1             |
| Commercial                   | PG&E    | 4,707,635  | 0.0053                                  | 24,985                       | wksht: Shasta Lake detail; calculations        | See Note 1             |
| Industrial                   | PG&E    | —          | —                                       | —                            | wksht: Shasta Lake detail; calculations        | See Note 1             |
| Subtotal                     |         | 6,067,315  | 15                                      | 32,201                       | summation                                      |                        |
| Unincorporated Shasta County |         |            |   |                              |  |                        |
| Residential                  | PG&E    | 3,565,367  | 0.0053                                  | 18,922                       | wksht: raw data; calculations, and conversions | See Note 1             |
| Commercial                   | PG&E    | 9,808,746  | 0.0053                                  | 52,056                       | wksht: raw data; calculations, and conversions | See Note 1             |
| Industrial                   | PG&E    | See Note 3 | 0.0053                                  | See Note 3                   | wksht: raw data; calculations, and conversions | See Note 3             |
| Subtotal                     |         | 13,374,113 | 32                                      | 70,978                       | summation                                      |                        |
| County Total                 |         | 41,765,716 |   | 221,658                      |  |                        |

Notes

- 1 The CO2-e emissions were reported and the emission rate was calculated.
- 2 PG&E did not provide a separate breakdown of natural gas consumption for Commercial and Industrial users in the Cities of Redding, Anderson, and Shasta Lake. It is assumed this is because there are not any industrial users in these jurisdictions.
- 3 Data provided by PG&E indicates that industrial users in the unincorporated areas of Shasta County consumed 296,322 therms of natural gas in 2008, the combustion of which generated 1,573 MT CO2-e/year (as shown in the "raw data" worksheet). However, this activity is not included in the calculations on this worksheet in order to avoid double-counting emissions from the combustion of natural gas by the 11 stationary sources listed in file "601 Stationary Sources.xlsx" It is assumed that most if not all of the consumption of natural gas by the industrial sector is accounted for by these 11 stationary sources. This assumption was approved by Adam Fieseler of the Shasta County Department of Resource Management in a phone conversation with Austin Kerr of Ascent Environmental on April 22, 2011.



## References

### Greenhouse Gas Inventory and Projections, Shasta County

5.0 References.xlsx

This table lists the references used to develop the 2008 GHG inventory and projections.



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## References

### Greenhouse Gas Inventory and Projections, Shasta County

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This table lists the references used to develop the 2008 GHG inventory and projections.



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## References

### Greenhouse Gas Inventory and Projections, Shasta County

5.0 References.xlsx

This table lists the references used to develop the 2008 GHG inventory and projections.



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| Year | Anderson | Redding |
|------|----------|---------|
| 1963 | 0        | 2,475   |
| 1964 | 0        | 3,018   |
| 1965 | 0        | 3,681   |
| 1966 | 0        | 4,489   |
| 1967 | 0        | 5,475   |
| 1968 | 0        | 6,677   |
| 1969 | 0        | 8,142   |
| 1970 | 0        | 9,929   |
| 1971 | 0        | 9,811   |
| 1972 | 0        | 12,971  |
| 1973 | 0        | 14,594  |
| 1974 | 0        | 15,185  |
| 1975 | 0        | 18,475  |
| 1976 | 0        | 22,934  |
| 1977 | 358      | 34,515  |
| 1978 | 358      | 42,320  |
| 1979 | 358      | 51,320  |
| 1980 | 358      | 53,155  |
| 1981 | 3,027    | 74,154  |
| 1982 | 1,996    | 75,522  |
| 1983 | 1,969    | 77,100  |
| 1984 | 1,984    | 78,743  |
| 1985 | 1,978    | 80,423  |
| 1986 | 1,861    | 82,103  |
| 1987 | 1,922    | 84,466  |
| 1988 | 2,185    | 87,010  |
| 1989 | 2,156    | 89,514  |
| 1990 | 2,251    | 20,810  |
| 1991 | 4,114    | 35,210  |
| 1992 | 5,649    | 62,398  |
| 1993 | 5,536    | 62,060  |
| 1994 | 5,673    | 57,937  |
| 1995 | 6,995    | 68,315  |
| 1996 | 6,244    | 70,277  |
| 1997 | 6,169    | 69,445  |
| 1998 | 6,063    | 69,750  |
| 1999 | 6,069    | 70,417  |
| 2000 | 6,456    | 73,837  |
| 2001 | 7,069    | 76,994  |
| 2002 | 7,602    | 81,333  |
| 2003 | 8,408    | 84,897  |
| 2004 | 9,075    | 86,667  |

|      |       |        |
|------|-------|--------|
| 2005 | 9,295 | 88,589 |
| 2006 | 9,510 | 90,429 |
| 2007 | 9,345 | 87,340 |
| 2008 | 9,491 | 88,238 |
| 2009 | 9,641 | 89,144 |
| 2010 | 9,794 | 90,062 |

Commercial 27,948

SFR 20,357

MFR 9,714

SHR 30,071

| Shasta Lake | Unincorp. Shasta County |
|-------------|-------------------------|
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 0           | 0                       |
| 332         | 4,964                   |
| 332         | 4,964                   |
| 332         | 4,964                   |
| 332         | 4,964                   |
| 2,622       | 28,345                  |
| 1,668       | 14,068                  |
| 1,642       | 13,689                  |
| 1,656       | 13,900                  |
| 1,651       | 13,815                  |
| 1,542       | 12,193                  |
| 1,599       | 13,046                  |
| 1,843       | 16,688                  |
| 1,816       | 16,283                  |
| 1,903       | 17,596                  |
| 3,505       | 34,099                  |
| 4,684       | 37,180                  |
| 4,582       | 35,820                  |
| 4,747       | 40,584                  |
| 5,882       | 52,188                  |
| 5,166       | 40,210                  |
| 5,104       | 39,717                  |
| 5,002       | 38,001                  |
| 5,002       | 37,635                  |
| 5,330       | 40,759                  |
| 5,871       | 47,275                  |
| 6,328       | 51,854                  |
| 7,045       | 60,823                  |
| 7,649       | 69,050                  |

|      | Unincorp. Shasta County          |                                    |  |              |
|------|----------------------------------|------------------------------------|--|--------------|
|      | <u>Benton</u><br><u>Landfill</u> | <u>Anderson</u><br><u>Landfill</u> | <u>West</u><br><u>Central</u><br><u>Landfill</u> | <u>Total</u> |
| 1963 | 0                                | 0                                  | 0  | 0            |
| 1964 | 0                                | 0                                  | 0  | 0            |
| 1965 | 0                                | 0                                  | 0  | 0            |
| 1966 | 0                                | 0                                  | 0  | 0            |
| 1967 | 0                                | 0                                  | 0  | 0            |
| 1968 | 0                                | 0                                  | 0  | 0            |
| 1969 | 0                                | 0                                  | 0  | 0            |
| 1970 | 0                                | 0                                  | 0  | 0            |
| 1971 | 0                                | 0                                  | 0  | 0            |
| 1972 | 0                                | 0                                  | 0  | 0            |
| 1973 | 0                                | 0                                  | 0  | 0            |
| 1974 | 0                                | 0                                  | 0  | 0            |
| 1975 | 0                                | 0                                  | 0  | 0            |
| 1976 | 0                                | 0                                  | 0  | 0            |
| 1977 | 0                                | 4,964                              | 0  | 4,964        |
| 1978 | 0                                | 4,964                              | 0  | 4,964        |
| 1979 | 0                                | 4,964                              | 0  | 4,964        |
| 1980 | 0                                | 4,964                              | 0  | 4,964        |
| 1981 | 0                                | 19,857                             | 8,487  | 28,345       |
| 1982 | 0                                | 5,581                              | 8,487  | 14,068       |
| 1983 | 0                                | 5,201                              | 8,487  | 13,689       |
| 1984 | 0                                | 5,412                              | 8,487  | 13,900       |
| 1985 | 0                                | 5,327                              | 8,487  | 13,815       |
| 1986 | 0                                | 3,706                              | 8,487  | 12,193       |
| 1987 | 0                                | 4,559                              | 8,487  | 13,046       |
| 1988 | 0                                | 8,201                              | 8,487  | 16,688       |
| 1989 | 0                                | 7,795                              | 8,487  | 16,283       |
| 1990 | 0                                | 9,108                              | 8,487  | 17,596       |
| 1991 | 0                                | 19,798                             | 14,301   | 34,099       |
| 1992 | 0                                | 11,517                             | 25,663   | 37,180       |
| 1993 | 0                                | 10,280                             | 25,540   | 35,820       |
| 1994 | 0                                | 16,838                             | 23,745   | 40,584       |
| 1995 | 0                                | 24,248                             | 27,939   | 52,188       |
| 1996 | 0                                | 11,284                             | 28,926   | 40,210       |
| 1997 | 0                                | 11,133                             | 28,584   | 39,717       |
| 1998 | 0                                | 9,266                              | 28,736   | 38,001       |
| 1999 | 0                                | 8,615                              | 29,020   | 37,635       |
| 2000 | 0                                | 10,346                             | 30,412   | 40,759       |
| 2001 | 0                                | 15,628                             | 31,647   | 47,275       |
| 2002 | 0                                | 18,450                             | 33,404   | 51,854       |
| 2003 | 0                                | 26,047                             | 34,776   | 60,823       |
| 2004 | 0                                | 33,644                             | 35,405   | 69,050       |



|       |        |
|-------|--------|
| 7,836 | 70,841 |
| 8,019 | 72,628 |
| 7,894 | 72,406 |
| 8,022 | 73,865 |
| 8,153 | 75,361 |
| 8,287 | 76,895 |

|      |   |        |        |        |
|------|---|--------|--------|--------|
| 2005 | 0 | 34,654 | 36,187 | 70,841 |
| 2006 | 0 | 35,693 | 36,935 | 72,628 |
| 2007 | 0 | 36,764 | 35,642 | 72,406 |
| 2008 | 0 | 37,867 | 35,998 | 73,865 |
| 2009 | 0 | 39,003 | 36,358 | 75,361 |
| 2010 | 0 | 40,173 | 36,722 | 76,895 |

67.7%

32.3%

|       |            |       |
|-------|------------|-------|
| SFR   | 8,583,746  | 64.8% |
| MFR   | 3,351,428  | 25.3% |
| SHR   | 1,302,634  | 9.8%  |
| Total | 13,237,808 |       |

|      |     | Shasta Lake                      |                                    |  |              |       |         |
|------|-----|----------------------------------|------------------------------------|--|--------------|-------|---------|
|      |     | <u>Benton</u><br><u>Landfill</u> | <u>Anderson</u><br><u>Landfill</u> | <u>West</u><br><u>Central</u><br><u>Landfill</u> | <u>Total</u> |       |         |
|      |     | 1963                             | 0                                  | 0  | 0            |       |         |
|      |     | 1964                             | 0                                  | 0  | 0            |       |         |
|      |     | 1965                             | 0                                  | 0  | 0            |       |         |
|      |     | 1966                             | 0                                  | 0  | 0            |       |         |
|      |     | 1967                             | 0                                  | 0  | 0            |       |         |
|      |     | 1968                             | 0                                  | 0  | 0            |       |         |
|      |     | 1969                             | 0                                  | 0  | 0            |       |         |
|      |     | 1970                             | 0                                  | 0  | 0            |       |         |
|      |     | 1971                             | 0                                  | 0  | 0            |       |         |
|      |     | 1972                             | 0                                  | 0  | 0            |       |         |
|      |     | 1973                             | 0                                  | 0  | 0            |       |         |
|      |     | 1974                             | 0                                  | 0  | 0            |       |         |
|      |     | 1975                             | 0                                  | 0  | 0            |       |         |
|      |     | 1976                             | 0                                  | 0  | 0            |       |         |
| 100% | 0%  | 1977                             | 0                                  | 332  | 0            | 332   | 100% 0% |
| 100% | 0%  | 1978                             | 0                                  | 332  | 0            | 332   | 100% 0% |
| 100% | 0%  | 1979                             | 0                                  | 332  | 0            | 332   | 100% 0% |
| 100% | 0%  | 1980                             | 0                                  | 332  | 0            | 332   | 100% 0% |
| 70%  | 30% | 1981                             | 0                                  | 1,328  | 1,294        | 2,622 | 51% 49% |
| 40%  | 60% | 1982                             | 0                                  | 373  | 1,294        | 1,668 | 22% 78% |
| 38%  | 62% | 1983                             | 0                                  | 348  | 1,294        | 1,642 | 21% 79% |
| 39%  | 61% | 1984                             | 0                                  | 362  | 1,294        | 1,656 | 22% 78% |
| 39%  | 61% | 1985                             | 0                                  | 356  | 1,294        | 1,651 | 22% 78% |
| 30%  | 70% | 1986                             | 0                                  | 248  | 1,294        | 1,542 | 16% 84% |
| 35%  | 65% | 1987                             | 0                                  | 305  | 1,294        | 1,599 | 19% 81% |
| 49%  | 51% | 1988                             | 0                                  | 548  | 1,294        | 1,843 | 30% 70% |
| 48%  | 52% | 1989                             | 0                                  | 521  | 1,294        | 1,816 | 29% 71% |
| 52%  | 48% | 1990                             | 0                                  | 609  | 1,294        | 1,903 | 32% 68% |
| 58%  | 42% | 1991                             | 0                                  | 1,324  | 2,181        | 3,505 | 38% 62% |
| 31%  | 69% | 1992                             | 0                                  | 770  | 3,914        | 4,684 | 16% 84% |
| 29%  | 71% | 1993                             | 0                                  | 687  | 3,895        | 4,582 | 15% 85% |
| 41%  | 59% | 1994                             | 0                                  | 1,126  | 3,621        | 4,747 | 24% 76% |
| 46%  | 54% | 1995                             | 0                                  | 1,621  | 4,261        | 5,882 | 28% 72% |
| 28%  | 72% | 1996                             | 0                                  | 754  | 4,411        | 5,166 | 15% 85% |
| 28%  | 72% | 1997                             | 0                                  | 744  | 4,359        | 5,104 | 15% 85% |
| 24%  | 76% | 1998                             | 0                                  | 620  | 4,382        | 5,002 | 12% 88% |
| 23%  | 77% | 1999                             | 0                                  | 576  | 4,426        | 5,002 | 12% 88% |
| 25%  | 75% | 2000                             | 0                                  | 692  | 4,638        | 5,330 | 13% 87% |
| 33%  | 67% | 2001                             | 0                                  | 1,045  | 4,826        | 5,871 | 18% 82% |
| 36%  | 64% | 2002                             | 0                                  | 1,234  | 5,094        | 6,328 | 19% 81% |
| 43%  | 57% | 2003                             | 0                                  | 1,742  | 5,304        | 7,045 | 25% 75% |
| 49%  | 51% | 2004                             | 0                                  | 2,250  | 5,400        | 7,649 | 29% 71% |

49% 51%  
49% 51%  
51% 49%  
51% 49%  
52% 48%  
52% 48%

|      |   |       |       |       |
|------|---|-------|-------|-------|
| 2005 | 0 | 2,317 | 5,519 | 7,836 |
| 2006 | 0 | 2,387 | 5,633 | 8,019 |
| 2007 | 0 | 2,458 | 5,436 | 7,894 |
| 2008 | 0 | 2,532 | 5,490 | 8,022 |
| 2009 | 0 | 2,608 | 5,545 | 8,153 |
| 2010 | 0 | 2,686 | 5,600 | 8,287 |

30% 70%  
30% 70%  
31% 69%  
32% 68%  
32% 68%  
32% 68%

|      | Anderson                   |                              |                                      |              |
|------|----------------------------|------------------------------|--------------------------------------|--------------|
|      | <u>Benton<br/>Landfill</u> | <u>Anderson<br/>Landfill</u> | <u>West<br/>Central<br/>Landfill</u> | <u>Total</u> |
| 1963 | 0                          | 0                            | 0                                    | 0            |
| 1964 | 0                          | 0                            | 0                                    | 0            |
| 1965 | 0                          | 0                            | 0                                    | 0            |
| 1966 | 0                          | 0                            | 0                                    | 0            |
| 1967 | 0                          | 0                            | 0                                    | 0            |
| 1968 | 0                          | 0                            | 0                                    | 0            |
| 1969 | 0                          | 0                            | 0                                    | 0            |
| 1970 | 0                          | 0                            | 0                                    | 0            |
| 1971 | 0                          | 0                            | 0                                    | 0            |
| 1972 | 0                          | 0                            | 0                                    | 0            |
| 1973 | 0                          | 0                            | 0                                    | 0            |
| 1974 | 0                          | 0                            | 0                                    | 0            |
| 1975 | 0                          | 0                            | 0                                    | 0            |
| 1976 | 0                          | 0                            | 0                                    | 0            |
| 1977 | 0                          | 358                          | 0                                    | 358          |
| 1978 | 0                          | 358                          | 0                                    | 358          |
| 1979 | 0                          | 358                          | 0                                    | 358          |
| 1980 | 0                          | 358                          | 0                                    | 358          |
| 1981 | 0                          | 1,434                        | 1,593                                | 3,027        |
| 1982 | 0                          | 403                          | 1,593                                | 1,996        |
| 1983 | 0                          | 376                          | 1,593                                | 1,969        |
| 1984 | 0                          | 391                          | 1,593                                | 1,984        |
| 1985 | 0                          | 385                          | 1,593                                | 1,978        |
| 1986 | 0                          | 268                          | 1,593                                | 1,861        |
| 1987 | 0                          | 329                          | 1,593                                | 1,922        |
| 1988 | 0                          | 592                          | 1,593                                | 2,185        |
| 1989 | 0                          | 563                          | 1,593                                | 2,156        |
| 1990 | 0                          | 658                          | 1,593                                | 2,251        |
| 1991 | 0                          | 1,429                        | 2,684                                | 4,114        |
| 1992 | 0                          | 831                          | 4,817                                | 5,649        |
| 1993 | 0                          | 742                          | 4,794                                | 5,536        |
| 1994 | 0                          | 1,216                        | 4,457                                | 5,673        |
| 1995 | 0                          | 1,751                        | 5,244                                | 6,995        |
| 1996 | 0                          | 815                          | 5,430                                | 6,244        |
| 1997 | 0                          | 804                          | 5,365                                | 6,169        |
| 1998 | 0                          | 669                          | 5,394                                | 6,063        |
| 1999 | 0                          | 622                          | 5,447                                | 6,069        |
| 2000 | 0                          | 747                          | 5,709                                | 6,456        |
| 2001 | 0                          | 1,128                        | 5,940                                | 7,069        |
| 2002 | 0                          | 1,332                        | 6,270                                | 7,602        |
| 2003 | 0                          | 1,881                        | 6,528                                | 8,408        |
| 2004 | 0                          | 2,429                        | 6,646                                | 9,075        |

|      |     |
|------|-----|
| 100% | 0%  |
| 7%   | 0%  |
| 7%   | 0%  |
| 7%   | 0%  |
| 5%   | 6%  |
| 3%   | 11% |
| 3%   | 12% |
| 3%   | 11% |
| 3%   | 12% |
| 2%   | 13% |
| 3%   | 12% |
| 4%   | 10% |
| 3%   | 10% |
| 4%   | 9%  |
| 4%   | 8%  |
| 2%   | 13% |
| 2%   | 13% |
| 3%   | 11% |
| 3%   | 10% |
| 2%   | 14% |
| 2%   | 14% |
| 2%   | 14% |
| 2%   | 14% |
| 2%   | 14% |
| 2%   | 13% |
| 3%   | 12% |
| 3%   | 11% |
| 4%   | 10% |

|      | <u>Benton<br/>Landfill</u> |
|------|----------------------------|
| 1963 | 2,475                      |
| 1964 | 3,018                      |
| 1965 | 3,681                      |
| 1966 | 4,489                      |
| 1967 | 5,475                      |
| 1968 | 6,677                      |
| 1969 | 8,142                      |
| 1970 | 9,929                      |
| 1971 | 9,811                      |
| 1972 | 12,971                     |
| 1973 | 14,594                     |
| 1974 | 15,185                     |
| 1975 | 18,475                     |
| 1976 | 22,934                     |
| 1977 | 34,353                     |
| 1978 | 42,158                     |
| 1979 | 51,158                     |
| 1980 | 52,993                     |
| 1981 | 52,993                     |
| 1982 | 54,828                     |
| 1983 | 56,418                     |
| 1984 | 58,054                     |
| 1985 | 59,737                     |
| 1986 | 61,470                     |
| 1987 | 63,805                     |
| 1988 | 66,230                     |
| 1989 | 68,747                     |
| 1990 | 0                          |
| 1991 | 0                          |
| 1992 | 0                          |
| 1993 | 0                          |
| 1994 | 0                          |
| 1995 | 0                          |
| 1996 | 0                          |
| 1997 | 0                          |
| 1998 | 0                          |
| 1999 | 0                          |
| 2000 | 0                          |
| 2001 | 0                          |
| 2002 | 0                          |
| 2003 | 0                          |
| 2004 | 0                          |

|      |   |       |       |       |
|------|---|-------|-------|-------|
| 2005 | 0 | 2,502 | 6,793 | 9,295 |
| 2006 | 0 | 2,577 | 6,933 | 9,510 |
| 2007 | 0 | 2,654 | 6,690 | 9,345 |
| 2008 | 0 | 2,734 | 6,757 | 9,491 |
| 2009 | 0 | 2,816 | 6,825 | 9,641 |
| 2010 | 0 | 2,900 | 6,893 | 9,794 |

|    |     |
|----|-----|
| 4% | 10% |
| 4% | 10% |
| 4% | 9%  |
| 4% | 9%  |
| 4% | 9%  |
| 4% | 9%  |

|      |   |
|------|---|
| 2005 | 0 |
| 2006 | 0 |
| 2007 | 0 |
| 2008 | 0 |
| 2009 | 0 |
| 2010 | 0 |

Redding

| <u>Anderson<br/>Landfill</u> | <u>West<br/>Central<br/>Landfill</u> | <u>Total</u> |     |      |
|------------------------------|--------------------------------------|--------------|-----|------|
| 0                            | 0                                    | 2,475        |     |      |
| 0                            | 0                                    | 3,018        |     |      |
| 0                            | 0                                    | 3,681        |     |      |
| 0                            | 0                                    | 4,489        |     |      |
| 0                            | 0                                    | 5,475        |     |      |
| 0                            | 0                                    | 6,677        |     |      |
| 0                            | 0                                    | 8,142        |     |      |
| 0                            | 0                                    | 9,929        |     |      |
| 0                            | 0                                    | 9,811        |     |      |
| 0                            | 0                                    | 12,971       |     |      |
| 0                            | 0                                    | 14,594       |     |      |
| 0                            | 0                                    | 15,185       |     |      |
| 0                            | 0                                    | 18,475       |     |      |
| 0                            | 0                                    | 22,934       |     |      |
| 162                          | 0                                    | 34,515       | 45% | 0%   |
| 162                          | 0                                    | 42,320       | 3%  | 0%   |
| 162                          | 0                                    | 51,320       | 3%  | 0%   |
| 162                          | 0                                    | 53,155       | 3%  | 0%   |
| 649                          | 20,512                               | 74,154       | 2%  | 72%  |
| 182                          | 20,512                               | 75,522       | 1%  | 146% |
| 170                          | 20,512                               | 77,100       | 1%  | 150% |
| 177                          | 20,512                               | 78,743       | 1%  | 148% |
| 174                          | 20,512                               | 80,423       | 1%  | 148% |
| 121                          | 20,512                               | 82,103       | 1%  | 168% |
| 149                          | 20,512                               | 84,466       | 1%  | 157% |
| 268                          | 20,512                               | 87,010       | 2%  | 123% |
| 255                          | 20,512                               | 89,514       | 2%  | 126% |
| 298                          | 20,512                               | 20,810       | 2%  | 117% |
| 647                          | 34,563                               | 35,210       | 2%  | 101% |
| 377                          | 62,021                               | 62,398       | 1%  | 167% |
| 336                          | 61,724                               | 62,060       | 1%  | 172% |
| 550                          | 57,387                               | 57,937       | 1%  | 141% |
| 793                          | 67,523                               | 68,315       | 2%  | 129% |
| 369                          | 69,908                               | 70,277       | 1%  | 174% |
| 364                          | 69,081                               | 69,445       | 1%  | 174% |
| 303                          | 69,447                               | 69,750       | 1%  | 183% |
| 282                          | 70,135                               | 70,417       | 1%  | 186% |
| 338                          | 73,499                               | 73,837       | 1%  | 180% |
| 511                          | 76,483                               | 76,994       | 1%  | 162% |
| 603                          | 80,730                               | 81,333       | 1%  | 156% |
| 852                          | 84,045                               | 84,897       | 1%  | 138% |
| 1,100                        | 85,567                               | 86,667       | 2%  | 124% |

|       |        |        |    |      |
|-------|--------|--------|----|------|
| 1,133 | 87,456 | 88,589 | 2% | 123% |
| 1,167 | 89,262 | 90,429 | 2% | 123% |
| 1,202 | 86,138 | 87,340 | 2% | 119% |
| 1,238 | 87,000 | 88,238 | 2% | 118% |
| 1,275 | 87,869 | 89,144 | 2% | 117% |
| 1,313 | 88,748 | 90,062 | 2% | 115% |



## Unit Conversions

6.0 Unit Conversions.xlsx



### CO2e Conversion Rates — Global Warming Potential

|                          | <u>CO2</u> | <u>CH4</u> | <u>N2O</u> | <u>units</u> | <u>source</u>                           |
|--------------------------|------------|------------|------------|--------------|---|
| global warming potential | 1          | 21         | 310        | unitless     | Ref 2, Table C.1 on pg. 94 (SAR column) |

Note: The global warming potential values from the IPCC's Second Assessment Report of 21 and 310 for CH4 and N2O, respectively, are used to maintain consistency with City of Palo Alto greenhouse gas inventory reporting and with California Registry reporting requirements.

### Mass Conversion Rates

| <u>value</u> | <u>units</u> | <u>source</u>  |
|--------------|--------------|--|
| 1,000        | kg/MT        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 1,000,000    | g/MT         | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 2,000        | lb/ton       | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 2,204.62     | lb/MT        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 453.59237    | g/lb         | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 1.1023       | ton/MT       | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 2.204622622  | lb/kg        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 2,204.62     | lb/MT        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 1,000        | g/kg         | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 907,184.74   | g/ton        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 1,000,000    | mg/kg        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 453,592      | mg/lb        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |
| 1,000,000    | mg/kg        | <a href="http://onlineconversion.com/weight_common.htm">onlineconversion.com/weight_common.htm</a> |

### Time Conversions Rates

| <u>rate</u> | <u>units</u> | <u>source</u>   |
|-------------|--------------|-----------------|
| 60          | min/hr       | Walter Cronkite |
| 365         | days/year    | Earth           |

### Energy Conversions Rates

| <u>value</u> | <u>units</u>       | <u>source</u>  |
|--------------|--------------------|--|
| 100,000      | Btu/therm (U.S.)   | definition   |
| 3,412        | Btu/kWh            | <a href="http://onlineconversion.com/energy.htm">onlineconversion.com/energy.htm</a> |
| 1,000,000    | Btu/MMBtu          | definition   |
| 0.100        | MMBtu/therm (U.S.) | definition   |

### Electricity Conversion Rates

| <u>value</u> | <u>units</u>    | <u>source</u>  |
|--------------|-----------------|--|
| 1,000        | kW-hr/MW-hr     | <a href="http://onlineconversion.com/energy.htm">onlineconversion.com/energy.htm</a> |
| 1,000,000    | KW-hr/mil kW-hr | common sense   |

## Unit Conversions

6.0 Unit Conversions.xlsx



### Area Conversion Rates

| <u>value</u> | <u>units</u> | <u>source</u>                 |
|--------------|--------------|-------------------------------|
| 0.405        | ha/acre      | onlineconversion.com/area.htm |

### Volume - Gas

| <u>value</u> | <u>units</u>         | <u>source</u>                   |
|--------------|----------------------|---------------------------------|
| 38.04        | standard cu. Ft./Nm3 | Sheet 5, RFI Response Data      |
| 28.32        | L/stand. cu. Ft.     | onlineconversion.com/volume.htm |
| 1,000        | L/m3                 | onlineconversion.com/volume.htm |

### Volume - Liquid

| <u>value</u> | <u>units</u>  | <u>source</u>                   |
|--------------|---------------|---------------------------------|
| 0.264        | gal/L         | onlineconversion.com/volume.htm |
| 1,000,000    | gal/MG        | onlineconversion.com/volume.htm |
| 7.481        | gal/cu ft     | onlineconversion.com/volume.htm |
| 325,851      | gal/acre-foot | onlineconversion.com/volume.htm |
| 0.326        | MG/acre-foot  | conversion calculation          |

### Volume - Timber

*A board foot is the volume of a one-foot length of a board one foot wide and one inch thick.*

| <u>value</u> | <u>units</u> | <u>source</u>                      |
|--------------|--------------|------------------------------------|
| 12.0         | bd ft/cu ft  | www.easysurf.cc/lumber.htm#bfcf2   |
| 833.3        | MBF/CCF      | www.easysurf.cc/lumber.htm#bfcf2   |
| 120          | bd ft/CCF    | calculation, where CCF = 100 cu ft |

### Energy Content of Distillate/Diesel Fuel

| <u>value</u> | <u>units</u>   | <u>source</u>           |
|--------------|----------------|-------------------------|
| 42           | gallons/barrel | Ref 5, pg. 4 (item 11)  |
| 5.825        | MMBtu/barrel   | Ref 5, pg. A-6, Table 4 |
| 0.139        | MMBtu/gallon   | calculation             |
| 138,690      | Btu/gallon     | conversion calculation  |

### Density of Greenhouse Gases

|   | <u>CO2</u> | <u>CH4</u> | <u>units</u>      | <u>source</u>                                     |
|---|------------|------------|-------------------|---|
| density of CO2 gas at stand. pressure and temp. | 1.977      | 0.717      | g/L               | www.engineeringtoolbox.com/gas-density-d_158.html |
| volume conversion rate                          | 28.32      | 28.32      | L/stand. cu. Ft.  | Unit Conversions.xlsx                             |
| mass conversion rate                            | 1,000,000  | 1,000,000  | g/MT              | Unit Conversions.xlsx                             |
| density   | 5.60E-05   | 2.03E-05   | MT/stand. cu. Ft. | conversion calculation                            |

Stationary Sources

Greenhouse Gas Inventory, 2008 Base Year

Stationary Sources Sector

601 Stationary Sources.xls



|                        | Redding | Anderson | Shasta Lake | Unincorp. Co. | Total County |
|------------------------|---------|----------|-------------|---------------|--------------|
| Non-Biomass Combustion | 82,350  | 0        | 21,745      | 458,334       | 562,428      |
| Biomass Combustion     | 0       | 0        | 50,293      | 1,812,693     | 1,862,987    |
| Total                  | 82,350  | 0        | 72,038      | 2,271,027     | 2,425,415    |

Source: See wksht: data provided by SCAQMD



| Daily Vehicle Miles Traveled (VMT)      |           |           |             |                         |                     | 2008      |           |             |                         |                     | 2020     |           |             |                         |                     | 2035 |  |  |  |  |
|---|-----------|-----------|-------------|-------------------------|---------------------|-----------|-----------|-------------|-------------------------|---------------------|----------|-----------|-------------|-------------------------|---------------------|------|--|--|--|--|
| Speed Bin (mph)                         | Year 2008 |           |             |                         |                     | Year 2020 |           |             |                         |                     | Year2035 |           |             |                         |                     |      |  |  |  |  |
|   | Anderson  | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson  | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total |      |  |  |  |  |
| 0 - 5                                   | 0         | 0         | 0           | 0                       | 0                   | 0         | 2         | 0           | 0                       | 2                   | 0        | 1         | 0           | 0                       | 1                   |      |  |  |  |  |
| 5 - 10                                  | 13        | 627       | 17          | 23                      | 680                 | 0         | 0         | 0           | 0                       | 0                   | 10       | 679       | 21          | 19                      | 729                 |      |  |  |  |  |
| 10 - 15                                 | 10,749    | 73,562    | 6,161       | 4,653                   | 95,125              | 12,118    | 83,377    | 7,055       | 6,093                   | 108,643             | 14,545   | 91,337    | 8,789       | 8,323                   | 122,994             |      |  |  |  |  |
| 15 - 20                                 | 5,511     | 58,837    | 6,254       | 9,831                   | 80,433              | 6,266     | 73,078    | 6,943       | 10,832                  | 97,119              | 12,129   | 87,503    | 8,649       | 13,435                  | 121,716             |      |  |  |  |  |
| 20 - 25                                 | 15,186    | 147,953   | 12,200      | 92,883                  | 268,222             | 15,903    | 146,972   | 15,109      | 96,361                  | 274,345             | 23,853   | 172,470   | 25,160      | 110,164                 | 331,647             |      |  |  |  |  |
| 25 - 30                                 | 14,509    | 173,682   | 11,248      | 39,215                  | 238,654             | 14,094    | 182,277   | 10,769      | 38,364                  | 245,504             | 15,961   | 194,287   | 13,042      | 42,059                  | 265,349             |      |  |  |  |  |
| 30 - 35                                 | 30,030    | 296,198   | 12,972      | 68,911                  | 408,111             | 35,505    | 370,526   | 15,496      | 79,397                  | 500,924             | 35,027   | 408,995   | 20,231      | 91,684                  | 555,937             |      |  |  |  |  |
| 35 - 40                                 | 31,335    | 255,732   | 9,726       | 41,386                  | 338,179             | 36,142    | 284,372   | 10,611      | 46,811                  | 377,936             | 43,491   | 324,394   | 15,022      | 66,216                  | 449,123             |      |  |  |  |  |
| 40 - 45                                 | 33,105    | 259,569   | 28,593      | 162,713                 | 483,980             | 35,816    | 282,581   | 32,223      | 171,415                 | 522,035             | 39,120   | 317,569   | 40,983      | 192,132                 | 589,804             |      |  |  |  |  |
| 45 - 50                                 | 30,378    | 112,494   | 5,304       | 169,620                 | 317,796             | 33,059    | 129,019   | 6,253       | 180,728                 | 349,059             | 37,059   | 155,440   | 9,259       | 203,489                 | 405,247             |      |  |  |  |  |
| 50 - 55                                 | 13,504    | 39,379    | 2,093       | 43,632                  | 98,608              | 14,133    | 43,411    | 2,355       | 44,908                  | 104,807             | 15,104   | 34,650    | 2,567       | 33,090                  | 85,411              |      |  |  |  |  |
| 55 - 60                                 | 35,710    | 298,521   | 49,120      | 87,402                  | 470,753             | 37,567    | 356,722   | 59,306      | 94,789                  | 548,384             | 41,945   | 433,002   | 80,504      | 127,435                 | 682,886             |      |  |  |  |  |
| 60 - 65                                 | 287,848   | 663,538   | 87,658      | 490,707                 | 1,529,751           | 364,498   | 979,761   | 106,694     | 599,241                 | 2,050,194           | 432,129  | 1,343,602 | 152,784     | 779,048                 | 2,707,563           |      |  |  |  |  |
| 65 - 70                                 | 0         | 0         | 0           | 0                       | 0                   | 0         | 0         | 0           | 0                       | 0                   | 0        | 0         | 0           | 0                       | 0                   |      |  |  |  |  |
| 70 - 75                                 | 0         | 0         | 0           | 0                       | 0                   | 0         | 0         | 0           | 0                       | 0                   | 0        | 0         | 0           | 0                       | 0                   |      |  |  |  |  |
| >75                                     | 0         | 0         | 0           | 0                       | 0                   | 0         | 0         | 0           | 0                       | 0                   | 0        | 0         | 0           | 0                       | 0                   |      |  |  |  |  |
| Total                                   | 507,878   | 2,380,092 | 231,346     | 1,210,976               | 4,330,292           | 605,101   | 2,932,098 | 272,814     | 1,368,939               | 5,178,952           | 710,373  | 3,563,929 | 377,011     | 1,667,094               | 6,318,407           |      |  |  |  |  |
| Specific Table from Fehr & Peers report | Table 3   | Table 3   | Table 3     | Table 3                 | Table3              | Table 5   | Table 5   | Table 5     | Table 5                 | Table 5             | Table 7  | Table 7   | Table 7     | Table 7                 | Table 7             |      |  |  |  |  |

Source: Fehr & Peers. 2012 (February 1). *Technical Memorandum: Shasta County CAP- VMT Estimates* . Prepared by David B. Robinson and Kwasi Donkor.

Note: Separate VMT projections were not provided for 2050. Therefore VMT in 2050 is assumed to be the same as 2035.

| CO2-e Emission Rates (g/mi) |           |           |                     |
|-----------------------------|-----------|-----------|---------------------|
| Speed Bin (mph)             | Year 2008 | Year 2020 | Years 2035 and 2050 |
| 0 - 5                       | 1,027.13  | 974.12    | 881.50              |
| 5 - 10                      | 1,463.23  | 1,451.79  | 1,416.88            |
| 10 - 15                     | 1,138.28  | 1,125.32  | 1,093.57            |
| 15 - 20                     | 910.51    | 897.32    | 869.58              |
| 20 - 25                     | 754.52    | 741.41    | 716.86              |
| 25 - 30                     | 665.25    | 651.43    | 627.02              |
| 30 - 35                     | 602.93    | 588.79    | 564.88              |
| 35 - 40                     | 560.80    | 546.63    | 523.36              |
| 40 - 45                     | 534.93    | 520.90    | 498.28              |
| 45 - 50                     | 523.20    | 509.45    | 487.47              |
| 50 - 55                     | 524.94    | 511.58    | 490.21              |
| 55 - 60                     | 540.77    | 527.96    | 507.17              |
| 60 - 65                     | 572.75    | 560.71    | 540.55              |

Source: wksht 2: CO2-e Emiss Factors

|                      | value     | units     | source                    |
|----------------------|-----------|-----------|---------------------------|
| Mass Conversion Rate | 1,000,000 | g/MT      | 6.0 Unit Conversions.xlsx |
| Time Conversion Rate | 347       | days/year | 6.0 Unit Conversions.xlsx |

| CO2 Emissions by Year (MT/year) |           |         |             |                         |                     |           |         |             |                         |                     |                     |         |             |                         |                     |
|---------------------------------|-----------|---------|-------------|-------------------------|---------------------|-----------|---------|-------------|-------------------------|---------------------|---------------------|---------|-------------|-------------------------|---------------------|
| Speed Bin (mph)                 | Year 2008 |         |             |                         |                     | Year 2020 |         |             |                         |                     | Years 2035 and 2050 |         |             |                         |                     |
|                                 | Anderson  | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson  | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson            | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total |
| 0 - 5                           | 0         | 0       | 0           | 0                       | 0                   | 0         | 1       | 0           | 0                       | 1                   | 0                   | 0       | 0           | 0                       | 0                   |
| 5 - 10                          | 7         | 318     | 9           | 12                      | 345                 | 0         | 0       | 0           | 0                       | 0                   | 5                   | 345     | 11          | 10                      | 370                 |
| 10 - 15                         | 4,246     | 29,056  | 2,433       | 1,838                   | 37,573              | 4,786     | 32,932  | 2,787       | 2,407                   | 42,912              | 5,745               | 36,076  | 3,471       | 3,287                   | 48,580              |
| 15 - 20                         | 1,741     | 18,589  | 1,976       | 3,106                   | 25,413              | 1,980     | 23,089  | 2,194       | 3,422                   | 30,684              | 3,832               | 27,646  | 2,733       | 4,245                   | 38,456              |
| 20 - 25                         | 3,976     | 38,737  | 3,194       | 24,318                  | 70,225              | 4,164     | 38,480  | 3,956       | 25,229                  | 71,829              | 6,245               | 45,156  | 6,587       | 28,843                  | 86,831              |
| 25 - 30                         | 3,349     | 40,093  | 2,597       | 9,053                   | 55,092              | 3,253     | 42,077  | 2,486       | 8,856                   | 56,673              | 3,684               | 44,850  | 3,011       | 9,709                   | 61,254              |
| 30 - 35                         | 6,283     | 61,970  | 2,714       | 14,417                  | 85,384              | 7,428     | 77,520  | 3,242       | 16,611                  | 104,802             | 7,328               | 85,569  | 4,233       | 19,182                  | 116,312             |
| 35 - 40                         | 6,098     | 49,765  | 1,893       | 8,054                   | 65,809              | 7,033     | 55,339  | 2,065       | 9,109                   | 73,546              | 8,463               | 63,127  | 2,923       | 12,886                  | 87,399              |
| 40 - 45                         | 6,145     | 48,181  | 5,307       | 30,203                  | 89,836              | 6,648     | 52,453  | 5,981       | 31,818                  | 96,900              | 7,261               | 58,947  | 7,607       | 35,664                  | 109,479             |
| 45 - 50                         | 5,515     | 20,423  | 963         | 30,795                  | 57,696              | 6,002     | 23,424  | 1,135       | 32,811                  | 63,372              | 6,728               | 28,220  | 1,681       | 36,944                  | 73,573              |
| 50 - 55                         | 2,460     | 7,173   | 381         | 7,948                   | 17,962              | 2,574     | 7,908   | 429         | 8,180                   | 19,091              | 2,751               | 6,312   | 468         | 6,027                   | 15,558              |
| 55 - 60                         | 6,701     | 56,016  | 9,217       | 16,401                  | 88,335              | 7,049     | 66,937  | 11,129      | 17,787                  | 102,902             | 7,871               | 81,251  | 15,106      | 23,913                  | 128,141             |
| 60 - 65                         | 57,208    | 131,874 | 17,421      | 97,525                  | 304,028             | 72,442    | 194,721 | 21,205      | 119,095                 | 407,463             | 85,883              | 267,032 | 30,365      | 154,831                 | 538,111             |
| Total                           | 103,728   | 502,196 | 48,106      | 243,668                 | 897,698             | 123,360   | 614,881 | 56,608      | 275,326                 | 1,070,175           | 145,798             | 744,531 | 78,196      | 335,539                 | 1,304,064           |

Note: Separate VMT projections were not provided for 2050. Therefore VMT in 2050 is assumed to be the same as 2035.

| 2050      |           |             |                         |                     |
|-----------|-----------|-------------|-------------------------|---------------------|
| Year 2050 |           |             |                         |                     |
| Anderson  | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total |
| 0         | 0         | 0           | 0                       | 0                   |
| 10        | 653       | 20          | 18                      | 701                 |
| 16,777    | 96,155    | 10,522      | 10,926                  | 133,810             |
| 22,562    | 100,689   | 10,354      | 16,014                  | 146,593             |
| 34,382    | 194,498   | 40,263      | 121,032                 | 385,282             |
| 17,370    | 199,012   | 15,179      | 44,312                  | 275,613             |
| 33,208    | 433,851   | 25,383      | 101,743                 | 592,929             |
| 50,293    | 355,617   | 20,437      | 90,012                  | 512,904             |
| 41,062    | 342,970   | 50,092      | 206,954                 | 640,382             |
| 39,923    | 179,968   | 13,175      | 220,181                 | 452,131             |
| 15,512    | 26,578    | 2,689       | 23,431                  | 66,890              |
| 45,007    | 505,095   | 105,017     | 164,643                 | 817,213             |
| 492,329   | 1,770,698 | 210,252     | 973,308                 | 3,436,256           |
| 0         | 0         | 0           | 0                       | 0                   |
| 0         | 0         | 0           | 0                       | 0                   |
| 0         | 0         | 0           | 0                       | 0                   |
| 808,435   | 4,205,785 | 503,383     | 1,972,574               | 7,460,704           |
| Table 7   | Table 7   | Table 7     | Table 7                 | Table 7             |

Used dampening factor to sink with F&P

| Annual Growth Rates<br>2020 to 2035 |          |         |             |
|-------------------------------------|----------|---------|-------------|
| Jurisdiction                        | Anderson | Redding | Shasta Lake |
| 0 - 5                               | 0.0%     | -4.5%   | 0.0%        |
| 5 - 10                              | 0.0%     | 0.0%    | 0.0%        |
| 10 - 15                             | 1.2%     | 0.6%    | 1.5%        |
| 15 - 20                             | 4.5%     | 1.2%    | 1.5%        |
| 20 - 25                             | 2.7%     | 1.1%    | 3.5%        |
| 25 - 30                             | 0.8%     | 0.4%    | 1.3%        |
| 30 - 35                             | -0.1%    | 0.7%    | 1.8%        |
| 35 - 40                             | 1.2%     | 0.9%    | 2.3%        |
| 40 - 45                             | 0.6%     | 0.8%    | 1.6%        |
| 45 - 50                             | 0.8%     | 1.2%    | 2.7%        |
| 50 - 55                             | 0.4%     | -1.5%   | 0.6%        |
| 55 - 60                             | 0.7%     | 1.3%    | 2.1%        |
| 60 - 65                             | 1.1%     | 2.1%    | 2.4%        |
| 65 - 70                             | 0.0%     | 0.0%    | 0.0%        |
| 70 - 75                             | 0.0%     | 0.0%    | 0.0%        |
| >75                                 | 0.0%     | 0.0%    | 0.0%        |
| Total                               | 1.1%     | 1.3%    | 2.2%        |

| Years 2035 and 2050 |          |
|---------------------|----------|
|                     | 881.50   |
|                     | 1,416.88 |
|                     | 1,093.57 |
|                     | 869.58   |
|                     | 716.86   |
|                     | 627.02   |
|                     | 564.88   |
|                     | 523.36   |
|                     | 498.28   |
|                     | 487.47   |
|                     | 490.21   |
|                     | 507.17   |
|                     | 540.55   |

From F&P Kwasi Donkor estimate March 6th 2012 - Countywide only

| Model Year | 2020      | 2035      | 2050      |
|------------|-----------|-----------|-----------|
| VMT        | 5,178,952 | 6,318,407 | 7,457,862 |

1.3% 7708560.925

| Years 2035 and 2050 |         |             |                         |                     |
|---------------------|---------|-------------|-------------------------|---------------------|
| Anderson            | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total |
| 0                   | 0       | 0           | 0                       | 0                   |
| 5                   | 331     | 10          | 9                       | 356                 |
| 6,627               | 37,979  | 4,156       | 4,315                   | 52,853              |
| 7,128               | 31,812  | 3,271       | 5,059                   | 46,316              |
| 9,002               | 50,923  | 10,542      | 31,689                  | 100,874             |
| 4,010               | 45,940  | 3,504       | 10,229                  | 63,623              |
| 6,948               | 90,769  | 5,311       | 21,286                  | 124,051             |
| 9,787               | 69,203  | 3,977       | 17,516                  | 99,811              |
| 7,622               | 63,662  | 9,298       | 38,415                  | 118,868             |
| 7,248               | 32,674  | 2,392       | 39,974                  | 82,085              |
| 2,826               | 4,841   | 490         | 4,268                   | 12,184              |
| 8,445               | 94,779  | 19,706      | 30,895                  | 153,347             |
| 97,847              | 351,915 | 41,786      | 193,439                 | 682,934             |
| 167,495             | 874,830 | 104,443     | 397,095                 | 1,537,300           |

| Unincorporated | Shasta Total |
|----------------|--------------|
| 0.0%           | -4.5%        |
| 0.0%           | 0.0%         |
| 2.1%           | 0.8%         |
| 1.4%           | 1.5%         |
| 0.9%           | 1.3%         |
| 0.6%           | 0.5%         |
| 1.0%           | 0.7%         |
| 2.3%           | 1.2%         |
| 0.8%           | 0.8%         |
| 0.8%           | 1.0%         |
| -2.0%          | -1.4%        |
| 2.0%           | 1.5%         |
| 1.8%           | 1.9%         |
| 0.0%           | 0.0%         |
| 0.0%           | 0.0%         |
| 0.0%           | 0.0%         |
| 1.3%           | 1.3%         |



| Daily Vehicle Miles Traveled (VMT)      |           |           |             |                         |                     | 2008      |           |             |                         |                     | 2020     |           |             |                         |                     | 2035 |  |  |  |  |
|---|-----------|-----------|-------------|-------------------------|---------------------|-----------|-----------|-------------|-------------------------|---------------------|----------|-----------|-------------|-------------------------|---------------------|------|--|--|--|--|
| Speed Bin (mph)                         | Year 2008 |           |             |                         |                     | Year 2020 |           |             |                         |                     | Year2035 |           |             |                         |                     |      |  |  |  |  |
|   | Anderson  | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson  | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total |      |  |  |  |  |
| 0 - 5                                   | 0         | 0         | 0           | 0                       | 0                   | 0         | 2         | 0           | 0                       | 2                   | 0        | 1         | 0           | 0                       | 1                   |      |  |  |  |  |
| 5 - 10                                  | 18        | 627       | 17          | 23                      | 685                 | 0         | 0         | 0           | 0                       | 0                   | 20       | 679       | 21          | 19                      | 739                 |      |  |  |  |  |
| 10 - 15                                 | 6,362     | 73,562    | 6,161       | 4,653                   | 90,738              | 7,044     | 83,377    | 7,055       | 6,093                   | 103,569             | 8,312    | 91,337    | 8,789       | 8,323                   | 116,761             |      |  |  |  |  |
| 15 - 20                                 | 6,459     | 58,837    | 6,254       | 9,831                   | 81,381              | 6,932     | 73,078    | 6,943       | 10,832                  | 97,785              | 8,180    | 87,503    | 8,649       | 13,435                  | 117,767             |      |  |  |  |  |
| 20 - 25                                 | 12,599    | 147,953   | 12,200      | 92,883                  | 265,635             | 15,086    | 146,972   | 15,109      | 96,361                  | 273,528             | 23,795   | 172,470   | 25,160      | 110,164                 | 331,589             |      |  |  |  |  |
| 25 - 30                                 | 11,616    | 173,682   | 11,248      | 39,215                  | 235,761             | 10,752    | 182,277   | 10,769      | 38,364                  | 242,162             | 12,334   | 194,287   | 13,042      | 42,059                  | 261,722             |      |  |  |  |  |
| 30 - 35                                 | 13,396    | 296,198   | 12,972      | 68,911                  | 391,477             | 15,472    | 370,526   | 15,496      | 79,397                  | 480,891             | 19,133   | 408,995   | 20,231      | 91,684                  | 540,043             |      |  |  |  |  |
| 35 - 40                                 | 10,044    | 255,732   | 9,726       | 41,386                  | 316,888             | 10,595    | 284,372   | 10,611      | 46,811                  | 352,389             | 14,207   | 324,394   | 15,022      | 66,216                  | 419,839             |      |  |  |  |  |
| 40 - 45                                 | 29,528    | 259,569   | 28,593      | 162,713                 | 480,403             | 32,173    | 282,581   | 32,223      | 171,415                 | 518,392             | 38,759   | 317,569   | 40,983      | 192,132                 | 589,443             |      |  |  |  |  |
| 45 - 50                                 | 5,477     | 112,494   | 5,304       | 169,620                 | 292,895             | 6,243     | 129,019   | 6,253       | 180,728                 | 322,243             | 8,757    | 155,440   | 9,259       | 203,489                 | 376,945             |      |  |  |  |  |
| 50 - 55                                 | 2,161     | 39,379    | 2,093       | 43,632                  | 87,265              | 2,351     | 43,411    | 2,355       | 44,908                  | 93,025              | 2,428    | 34,650    | 2,567       | 33,090                  | 72,735              |      |  |  |  |  |
| 55 - 60                                 | 50,726    | 298,521   | 49,120      | 87,402                  | 485,769             | 59,215    | 356,722   | 59,306      | 94,789                  | 570,032             | 76,136   | 433,002   | 80,504      | 127,435                 | 717,077             |      |  |  |  |  |
| 60 - 65                                 | 90,525    | 663,538   | 87,658      | 490,707                 | 1,332,428           | 106,530   | 979,761   | 106,694     | 599,241                 | 1,792,226           | 144,494  | 1,343,602 | 152,784     | 779,048                 | 2,419,928           |      |  |  |  |  |
| 65 - 70                                 | 0         | 0         | 0           | 0                       | 0                   | 0         | 0         | 0           | 0                       | 0                   | 0        | 0         | 0           | 0                       | 0                   |      |  |  |  |  |
| 70 - 75                                 | 0         | 0         | 0           | 0                       | 0                   | 0         | 0         | 0           | 0                       | 0                   | 0        | 0         | 0           | 0                       | 0                   |      |  |  |  |  |
| >75                                     | 0         | 0         | 0           | 0                       | 0                   | 0         | 0         | 0           | 0                       | 0                   | 0        | 0         | 0           | 0                       | 0                   |      |  |  |  |  |
| Total                                   | 238,912   | 2,380,092 | 231,346     | 1,210,976               | 4,061,326           | 272,394   | 2,932,098 | 272,814     | 1,368,939               | 4,846,245           | 356,554  | 3,563,929 | 377,011     | 1,667,094               | 5,964,588           |      |  |  |  |  |
| Specific Table from Fehr & Peers report | Table 3   | Table 3   | Table 3     | Table 3                 | Table3              | Table 5   | Table 5   | Table 5     | Table 5                 | Table 5             | Table 7  | Table 7   | Table 7     | Table 7                 | Table 7             |      |  |  |  |  |

Source: Fehr & Peers. 2012 (February 1). *Technical Memorandum: Shasta County CAP- VMT Estimates* . Prepared by David B. Robinson and Kwasi Donkor.

Note: Separate VMT projections were not provided for 2050. Therefore VMT in 2050 is assumed to be the same as 2035.

| CO2-e Emission Rates (g/mi) |           |  |                     |
|-----------------------------|-----------|--|---------------------|
| Speed Bin (mph)             | Year 2008 |  | Years 2035 and 2050 |
| 0 - 5                       | 1,027.13  |  | 881.50              |
| 5 - 10                      | 1,463.23  |  | 1,416.88            |
| 10 - 15                     | 1,138.28  |  | 1,093.57            |
| 15 - 20                     | 910.51    |  | 869.58              |
| 20 - 25                     | 754.52    |  | 716.86              |
| 25 - 30                     | 665.25    |  | 627.02              |
| 30 - 35                     | 602.93    |  | 564.88              |
| 35 - 40                     | 560.80    |  | 523.36              |
| 40 - 45                     | 534.93    |  | 498.28              |
| 45 - 50                     | 523.20    |  | 487.47              |
| 50 - 55                     | 524.94    |  | 490.21              |
| 55 - 60                     | 540.77    |  | 507.17              |
| 60 - 65                     | 572.75    |  | 540.55              |

Source: wksht 2: CO2-e Emiss Factors

|                      | value     | units     | source                    |
|----------------------|-----------|-----------|---------------------------|
| Mass Conversion Rate | 1,000,000 | g/MT      | 6.0 Unit Conversions.xlsx |
| Time Conversion Rate | 347       | days/year | 6.0 Unit Conversions.xlsx |

| CO2 Emissions by Year (MT/year) |           |         |             |                         |                     |           |         |             |                         |                     |                     |         |             |                         |                     |
|---------------------------------|-----------|---------|-------------|-------------------------|---------------------|-----------|---------|-------------|-------------------------|---------------------|---------------------|---------|-------------|-------------------------|---------------------|
| Speed Bin (mph)                 | Year 2008 |         |             |                         |                     | Year 2020 |         |             |                         |                     | Years 2035 and 2050 |         |             |                         |                     |
|                                 | Anderson  | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson  | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total | Anderson            | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total |
| 0 - 5                           | 0         | 0       | 0           | 0                       | 0                   | 0         | 1       | 0           | 0                       | 1                   | 0                   | 0       | 0           | 0                       | 0                   |
| 5 - 10                          | 9         | 318     | 9           | 12                      | 348                 | 0         | 0       | 0           | 0                       | 0                   | 10                  | 345     | 11          | 10                      | 375                 |
| 10 - 15                         | 2,513     | 29,056  | 2,433       | 1,838                   | 35,840              | 2,782     | 32,932  | 2,787       | 2,407                   | 40,908              | 3,283               | 36,076  | 3,471       | 3,287                   | 46,119              |
| 15 - 20                         | 2,041     | 18,589  | 1,976       | 3,106                   | 25,712              | 2,190     | 23,089  | 2,194       | 3,422                   | 30,895              | 2,584               | 27,646  | 2,733       | 4,245                   | 37,208              |
| 20 - 25                         | 3,299     | 38,737  | 3,194       | 24,318                  | 69,548              | 3,950     | 38,480  | 3,956       | 25,229                  | 71,615              | 6,230               | 45,156  | 6,587       | 28,843                  | 86,816              |
| 25 - 30                         | 2,681     | 40,093  | 2,597       | 9,053                   | 54,424              | 2,482     | 42,077  | 2,486       | 8,856                   | 55,901              | 2,847               | 44,850  | 3,011       | 9,709                   | 60,417              |
| 30 - 35                         | 2,803     | 61,970  | 2,714       | 14,417                  | 81,904              | 3,237     | 77,520  | 3,242       | 16,611                  | 100,611             | 4,003               | 85,569  | 4,233       | 19,182                  | 112,986             |
| 35 - 40                         | 1,955     | 49,765  | 1,893       | 8,054                   | 61,666              | 2,062     | 55,339  | 2,065       | 9,109                   | 68,574              | 2,765               | 63,127  | 2,923       | 12,886                  | 81,700              |
| 40 - 45                         | 5,481     | 48,181  | 5,307       | 30,203                  | 89,172              | 5,972     | 52,453  | 5,981       | 31,818                  | 96,224              | 7,194               | 58,947  | 7,607       | 35,664                  | 109,412             |
| 45 - 50                         | 994       | 20,423  | 963         | 30,795                  | 53,176              | 1,133     | 23,424  | 1,135       | 32,811                  | 58,504              | 1,590               | 28,220  | 1,681       | 36,944                  | 68,435              |
| 50 - 55                         | 394       | 7,173   | 381         | 7,948                   | 15,896              | 428       | 7,908   | 429         | 8,180                   | 16,945              | 442                 | 6,312   | 468         | 6,027                   | 13,249              |
| 55 - 60                         | 9,519     | 56,016  | 9,217       | 16,401                  | 91,153              | 11,111    | 66,937  | 11,129      | 17,787                  | 106,964             | 14,287              | 81,251  | 15,106      | 23,913                  | 134,556             |
| 60 - 65                         | 17,991    | 131,874 | 17,421      | 97,525                  | 264,811             | 21,172    | 194,721 | 21,205      | 119,095                 | 356,193             | 28,717              | 267,032 | 30,365      | 154,831                 | 480,945             |
| Total                           | 49,679    | 502,196 | 48,106      | 243,668                 | 843,649             | 56,520    | 614,881 | 56,608      | 275,326                 | 1,003,335           | 73,953              | 744,531 | 78,196      | 335,539                 | 1,232,219           |

Note: Separate VMT projections were not provided for 2050. Therefore VMT in 2050 is assumed to be the same as 2035.



| 2050      |           |             |                         |                     |
|-----------|-----------|-------------|-------------------------|---------------------|
| Year 2050 |           |             |                         |                     |
| Anderson  | Redding   | Shasta Lake | Unincorp. Shasta County | Shasta County Total |
| #NAME?    | 0         | 0           | 0                       | #NAME?              |
| #NAME?    | 653       | 20          | 18                      | #NAME?              |
| #NAME?    | 96,155    | 10,522      | 10,926                  | #NAME?              |
| #NAME?    | 100,689   | 10,354      | 16,014                  | #NAME?              |
| #NAME?    | 194,498   | 40,263      | 121,032                 | #NAME?              |
| #NAME?    | 199,012   | 15,179      | 44,312                  | #NAME?              |
| #NAME?    | 433,851   | 25,383      | 101,743                 | #NAME?              |
| #NAME?    | 355,617   | 20,437      | 90,012                  | #NAME?              |
| #NAME?    | 342,970   | 50,092      | 206,954                 | #NAME?              |
| #NAME?    | 179,968   | 13,175      | 220,181                 | #NAME?              |
| #NAME?    | 26,578    | 2,689       | 23,431                  | #NAME?              |
| #NAME?    | 505,095   | 105,017     | 164,643                 | #NAME?              |
| #NAME?    | 1,770,698 | 210,252     | 973,308                 | #NAME?              |
| #NAME?    | 0         | 0           | 0                       | #NAME?              |
| #NAME?    | 0         | 0           | 0                       | #NAME?              |
| #NAME?    | 0         | 0           | 0                       | #NAME?              |
| #NAME?    | 4,205,785 | 503,383     | 1,972,574               | #NAME?              |
| Table 7   | Table 7   | Table 7     | Table 7                 | Table 7             |

Used dampening factor to sink with F&P

| Annual Growth Rates<br>2020 to 2035 |          |         |             |
|-------------------------------------|----------|---------|-------------|
| Jurisdiction                        | Anderson | Redding | Shasta Lake |
| 0 - 5                               | #####    | -4.5%   | 0.0%        |
| 5 - 10                              | #####    | 0.0%    | 0.0%        |
| 10 - 15                             | #####    | 0.6%    | 1.5%        |
| 15 - 20                             | #####    | 1.2%    | 1.5%        |
| 20 - 25                             | #####    | 1.1%    | 3.5%        |
| 25 - 30                             | #####    | 0.4%    | 1.3%        |
| 30 - 35                             | #####    | 0.7%    | 1.8%        |
| 35 - 40                             | #####    | 0.9%    | 2.3%        |
| 40 - 45                             | #####    | 0.8%    | 1.6%        |
| 45 - 50                             | #####    | 1.2%    | 2.7%        |
| 50 - 55                             | #####    | -1.5%   | 0.6%        |
| 55 - 60                             | #####    | 1.3%    | 2.1%        |
| 60 - 65                             | #####    | 2.1%    | 2.4%        |
| 65 - 70                             | #####    | 0.0%    | 0.0%        |
| 70 - 75                             | #####    | 0.0%    | 0.0%        |
| >75                                 | #####    | 0.0%    | 0.0%        |
| Total                               | #####    | 1.3%    | 2.2%        |

| Years 2035 and 2050 |          |
|---------------------|----------|
|                     | 881.50   |
|                     | 1,416.88 |
|                     | 1,093.57 |
|                     | 869.58   |
|                     | 716.86   |
|                     | 627.02   |
|                     | 564.88   |
|                     | 523.36   |
|                     | 498.28   |
|                     | 487.47   |
|                     | 490.21   |
|                     | 507.17   |
|                     | 540.55   |

|  |           |           |             |
|--|-----------|-----------|-------------|
| From F&P Kwasi Donkor estimate March 6th 2012 - Countywide |           |           |             |
| Model Year   | 2020      | 2035      | 2050        |
| VMT  | 5,178,952 | 6,318,407 | 7,457,862   |
|  |           | 1.3%      | 7708560.925 |

| Years 2035 and 2050 |         |             |                         |                     |
|---------------------|---------|-------------|-------------------------|---------------------|
| Anderson            | Redding | Shasta Lake | Unincorp. Shasta County | Shasta County Total |
| #NAME?              | 0       | 0           | 0                       | #NAME?              |
| #NAME?              | 331     | 10          | 9                       | #NAME?              |
| #NAME?              | 37,979  | 4,156       | 4,315                   | #NAME?              |
| #NAME?              | 31,812  | 3,271       | 5,059                   | #NAME?              |
| #NAME?              | 50,923  | 10,542      | 31,689                  | #NAME?              |
| #NAME?              | 45,940  | 3,504       | 10,229                  | #NAME?              |
| #NAME?              | 90,769  | 5,311       | 21,286                  | #NAME?              |
| #NAME?              | 69,203  | 3,977       | 17,516                  | #NAME?              |
| #NAME?              | 63,662  | 9,298       | 38,415                  | #NAME?              |
| #NAME?              | 32,674  | 2,392       | 39,974                  | #NAME?              |
| #NAME?              | 4,841   | 490         | 4,268                   | #NAME?              |
| #NAME?              | 94,779  | 19,706      | 30,895                  | #NAME?              |
| #NAME?              | 351,915 | 41,786      | 193,439                 | #NAME?              |
| #NAME?              | 874,830 | 104,443     | 397,095                 | #NAME?              |

| Unincorporated | Shasta Total |
|----------------|--------------|
| 0.0%           | #####        |
| 0.0%           | #####        |
| 2.1%           | #####        |
| 1.4%           | #####        |
| 0.9%           | #####        |
| 0.6%           | #####        |
| 1.0%           | #####        |
| 2.3%           | #####        |
| 0.8%           | #####        |
| 0.8%           | #####        |
| -2.0%          | #####        |
| 2.0%           | #####        |
| 1.8%           | #####        |
| 0.0%           | #####        |
| 0.0%           | #####        |
| 0.0%           | #####        |
| 1.3%           | #####        |

e only

Water Consumption in the City of Redding, 2008



Water Consumption in Redding by Source, 2008

|   |            |                |   |
|---|------------|----------------|---|
| Ground Water                              | value      | units          | source  |
| volume consumed                           | 7,991      | acre-feet      | wksht: Redding raw                              |
| volume conversion rate                    | 0.326      | MG/acre-foot   | 6.0 Unit Conversions.xlsx                       |
| volume consumed                           | 2,604      | MG             | conversion calculation                          |
| average depth of groundwater well         | 500        | feet           | extrapolation using northern contours in Ref 31 |
| electricity consumption rate              | 4.45       | kW-hr/MG/foot  | Ref 29, pg. 40                                  |
| electricity consumed                      | 5,793,669  | kW-hr          | calculation                                     |
| electricity conversion rate               | 1,000      | kW-hr/MW-hr    | 6.0 Unit Conversions.xlsx                       |
| electricity consumed                      | 5,794      | MW-hr          | conversion calculation                          |
| local electric utility                    | REU        | none           | 401 Electricity Consumption                     |
| emission rate of local utility            | 0.297      | MT CO2-e/MW-hr | 401 Electricity Consumption                     |
| CO2-e emissions                           | 1,721      | MT             | calculation                                     |
| Surface Water and Purchased Water         |            |                |   |
| volume of surface water consumed          | 18,522     | acre-feet      | wksht: Redding raw; See Note 1                  |
| volume of purchased water consumed        | 631        | acre-feet      | wksht: Redding raw                              |
| total                                     | 19,153     | acre-feet      | summation                                       |
| volume conversion rate                    | 0.326      | MG/acre-foot   | 6.0 Unit Conversions.xlsx                       |
| volume consumed                           | 6,241      | MG             | conversion calculation                          |
| electricity consumption rates, by process |            |                |   |
| water supply and conveyance               | 2,117      | kWh/MG         | Ref 29, pg. 20 and Table ES-1 on pg. 2          |
| water treatment                           | 111        | kWh/MG         | Ref 29, pg. 20 and Table ES-1 on pg. 2          |
| water distribution                        | 1,272      | kWh/MG         | Ref 29, pg. 20 and Table ES-1 on pg. 2          |
| total conveyance, treatment, distribution | 3,500      | kWh/MG         | summation                                       |
| electricity consumed                      | 21,843,552 | kW-hr          | calculation                                     |
| electricity conversion rate               | 1,000      | kW-hr/MW-hr    | 6.0 Unit Conversions.xlsx                       |
| electricity consumed                      | 21,844     | MW-hr          | conversion calculation                          |
| local electric utility                    | REU        | none           | 401 Electricity Consumption                     |
| emission rate of local utility            | 0.297      | MT CO2-e/MW-hr | 401 Electricity Consumption                     |
| CO2-e emissions                           | 6,488      | MT             | calculation                                     |
| Total Water Consumption                   | 8,845      | MG             | summation                                       |
| Total Electricity Consumption             | 27,637     | MW-hr          | summation                                       |
| Total CO2-e emissions                     | 8,208      | MT             | summation                                       |

Customer Class Breakdown

|                              | <u>Metered Customers</u> | <u>Consumption</u><br><u>(acre-feet of metered</u> | <u>Percent of Total Water</u> | <u>CO2-e Emissions</u> |
|------------------------------|--------------------------|--|-------------------------------|------------------------|
| <u>Class (land use type)</u> | <u>(number)</u>          | <u>water/year)</u>                                 | <u>Consumption (%)</u>        | <u>(MT)</u>            |
| Residential                  | 24,670                   | 18,837   | 69%                           | 5,696                  |
| Single Family Residential    | 22,927                   | 16,499   | 61%                           | 4,989                  |
| Multi Family Residential     | 1,743                    | 2,338  | 9%                            | 707                    |
| Commercial/Institutional     | 2,825                    | 6,720  | 25%                           | 2,032                  |
| Industrial                   | 165                      | 198  | 1%                            | 60                     |
| Irrigation/Agriculture       | NR                       | 93   | 0.3%                          | 28                     |
| Other                        | 313                      | 1,296  | 5%                            | 392                    |
| Total                        | 27,973                   | 27,144   | 100%                          | 8,208                  |

Source: The number of metered customers and consumption levels are from wksht: Redding raw. The percentage breakdown is calculated using this. Levels of CO2-e emissions are based on the percentage breakdown.

Notes

- NR = not reported
- 1 It is assumed that purchased water is surface water and not ground water.



Discuss with HW and possibly CT and CC.



Potential Reduction Measures for Forestry Sector

What type of reduction measures might be developed for the forestry sector? - None

Would any measures be developed for the forestry sector? - No, not much

Is there anything the County could do to encourage (or not discourage) industry owners of productive forest lands to implement Forest Projects to earn credits in accordance with ARB's Forest Project Protoco

Reforestation Projects (which are eligible on private and public lands

Improved Forest Management Projects (which are eligible on private and public lands

Avoided Conversion Projects (only eligible on private lands;

Perhaps there are ways for the County to help small landowners group together to implement Forest Projects jointly, so that a single Forest Project can be implemented with an economy of scale that is cost-effective? The Forest Project Protocol may require their lands to be adjacent, howeve

Should the forestry sector be part of the jurisdictional inventory?

If a Forest Project earns carbon credits that are sold to a buyer then can the County still include the credit towards its reduction goals? - No, and this is an important point to convey to the Working Grou

Methodology for Baseline Inventory

Option 1. Include all emissions sources but do not include sequestration

Base the inventory on a 100-year growing cycle.

Only include productive forest lands.

Maybe have a separate emission rate (per acre) for actively managed productive forest lands, which are industry-owned, and for privately-owned forest lands, which are not actively managed

The method includes the following emission sources:

growing of seedlings, if occurs in the County

site preparation before planting seedlings

planting

felling

skidding (from point of felling to loading point)

processing (in forest)

loading

hauling to a process point (i.e., mill) - on Forest roads; On-road truck hauling would be accounted for in the transporation secto

Milling - would be included in the stationary source sector

The level of effort involved is high, as this would be a bottom-up approach

SPI and Roseburg will not like this approach and therefore may not be cooperative in helping develop reduction measures

Option 2. Include existing an projected sequestration, using methodologies similar to those used by SPI in the GHG analyses of its THPs

A top-down approach.

But then don't include the carbon sequestration towards the County's reduction goal because the credits would be sold by SPI and other industry grower:

In this case, the sector should not be included in the County's jurisdictional inventory

Other Options?

## **Appendix B –**

# **Emissions Reduction Potential Quantification Methodology**

## UNINCORPORATED SHASTA COUNTY





## GREENHOUSE GAS REDUCTION MEASURE QUANTIFICATION METHODOLOGY

This appendix summarizes the methodology for quantifying greenhouse gas (GHG) reductions resulting from implementing the Climate Action Plan (CAP) measures. Calculations and/or background information are only shown for horizon year 2020. Energy emissions factors based on an RPS-compliant energy source mix were used to quantify emissions reductions for all measures resulting in electricity savings to avoid double counting.

### Measure BE-1: Existing Buildings

This measure estimates the reduction in energy-related emissions (i.e., electricity and natural gas) resulting from retrofitting existing residential units and commercial properties. The measure includes retrofitting both single- and multi-family units based on a pre-defined package of energy efficiency retrofits that include installation of programmable thermostats, gas water heater upgrades, installation of high-efficiency light bulbs, gas furnace upgrades, duct sealing, foundation insulation, and building envelope sealing/weatherization.

Baseline electricity and natural gas consumption levels per unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3, which covers 85 to 95 percent of Shasta County. Mitigated energy savings estimates were based on outputs from Lawrence Berkeley Laboratory's Home Energy Saver™ building energy modeling software. The model-derived energy savings estimates were downscaled in order to be conservative in emissions reduction calculations. Total energy savings were calculated by subtracting the mitigated electricity and natural gas consumption levels from baseline levels. See Table B-1 for data used to calculate emissions reductions.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|------|---|---|--|
| 2020 | 2% of existing residential buildings implement energy efficiency retrofits      | 201 MT CO <sub>2</sub> e/yr             | <i>Building Data: Shasta County Assessor's Office parcel data</i><br><br><i>Baseline Energy Consumption: Commercial End Use Survey, CEC, 2006</i><br><br><i>Energy Savings from Retrofit Packages: AECOM SSIme™ Building Energy Analysis</i> |
|      | 10% of existing non-residential buildings implement energy efficiency retrofits |   | <i>Baseline Energy Consumption: Residential Appliance Saturation Survey, CEC, 2010</i><br><br><i>Energy Savings from Retrofit Packages: SSIme Building Energy Model, AECOM 2011</i><br><br><i>Participation Rates: Shasta County, 2012</i>   |

### Measure BE-2: New Construction

Reductions associated with this measure are described in Statewide Measures Reductions on page B-24.

**Table B-1**  
**Residential Retrofits**

| <b>Baseline Energy Consumption</b>  |                    |                           |                      |                         |                        |                          |
|-------------------------------------|--------------------|---------------------------|----------------------|-------------------------|------------------------|--------------------------|
|                                     | <b>Total Units</b> | <b>Participation Rate</b> | <b>kWh/unit/year</b> | <b>therms/unit/year</b> | <b>Total kWhr/year</b> | <b>Total therms/year</b> |
| Single Family                       | 19,196             | 2%                        | 8,836                | 562                     | 3,392,317              | 215,624                  |
| Townhome                            | 244                | 2%                        | 5,762                | 327                     | 28,119                 | 1,595                    |
| 2-4 unit apartment                  | 373                | 2%                        | 4,595                | 305                     | 34,279                 | 2,279                    |
| 5+ unit apartment                   | 176                | 2%                        | 5,248                | 199                     | 18,473                 | 700                      |
| Mobile Home                         | 7,165              | 0%                        | na                   | na                      | na                     | na                       |
| <b>Total</b>                        | <b>27,154</b>      |                           |                      |                         | <b>3,473,187</b>       | <b>220,198</b>           |
| <b>Mitigated Energy Consumption</b> |                    |                           |                      |                         |                        |                          |
|                                     | <b>Total Units</b> | <b>Participation Rate</b> | <b>kWh/unit/year</b> | <b>therms/unit/year</b> | <b>Total kWhr/year</b> | <b>Total therms/year</b> |
| Single Family                       | 19,196             | 2%                        | 8,598                | 489                     | 3,300,825              | 187,893                  |
| Townhome                            | 244                | 2%                        | 5,565                | 305                     | 27,155                 | 1,491                    |
| 2-4 unit apartment                  | 373                | 2%                        | 4,483                | 290                     | 33,445                 | 2,161                    |
| 5+ unit apartment                   | 176                | 2%                        | 5,115                | 192                     | 18,006                 | 675                      |
| Mobile Home                         | 7,165              | 0%                        | na                   | na                      | na                     | na                       |
| <b>Total</b>                        | <b>27,154</b>      |                           |                      |                         | <b>3,379,432</b>       | <b>192,220</b>           |
| <b>Energy Savings</b>               |                    |                           |                      |                         | <b>93,755</b>          | <b>27,978</b>            |

**Table B-2**  
**Commercial Retrofits**

| <b>Baseline Energy Consumption</b>               |                   |                           |                      |                       |                        |                        |
|--|-------------------|---------------------------|----------------------|-----------------------|------------------------|------------------------|
|  | <b>Total SQFT</b> | <b>Participation Rate</b> | <b>kWh/sqft/year</b> | <b>kBTU/sqft/year</b> | <b>Total kWhr/year</b> | <b>Total kBTU/year</b> |
| All Office                                       | 140,620           | 10%                       | 11.1                 | 16.1                  | 155,684                | 225,796                |
| All Warehouse                                    | 265,576           | 10%                       | 22.7                 | 0.0                   | 601,954                | 0.0                    |
| Grocery  | 26,915            | 10%                       | 36.3                 | 0.0                   | 97,617                 | 0.0                    |
| Health   | 29,879            | 10%                       | 15.0                 | 46.6                  | 44,936                 | 139,237                |
| Large Office                                     | 12,606            | 10%                       | 14.2                 | 27.6                  | 17,901                 | 34,804                 |
| Restaurant                                       | 29,021            | 10%                       | 33.2                 | 214.0                 | 96,483                 | 621,172                |
| Retail   | 191,508           | 10%                       | 10.1                 | 12.8                  | 192,587                | 244,903                |
| <b>Total</b>                                     | <b>696,125</b>    | <b>-</b>                  | <b>-</b>             | <b>-</b>              | <b>1,207,161</b>       | <b>1,265,912</b>       |
| <b>Mitigated Energy Consumption</b>              |                   |                           |                      |                       |                        |                        |
|  | <b>Total SQFT</b> | <b>Participation Rate</b> | <b>kWh/sqft/year</b> | <b>kBTU/sqft/year</b> | <b>Total kWhr/year</b> | <b>Total kBTU/year</b> |
| All Office                                       | 140,620           | 10%                       | 9.9                  | 13.3                  | 139,051                | 186,789                |
| All Warehouse                                    | 265,576           | 10%                       | 22.5                 | 0.0                   | 598,734                | 0.0                    |
| Grocery  | 26,915            | 10%                       | 35.2                 | 0.0                   | 94,725                 | 0.0                    |
| Health   | 29,879            | 10%                       | 13.2                 | 40.5                  | 39,468                 | 121,059                |
| Large Office                                     | 12,606            | 10%                       | 12.6                 | 22.9                  | 15,879                 | 28,865                 |
| Restaurant                                       | 29,021            | 10%                       | 30.8                 | 211.9                 | 89,481                 | 614,936                |
| Retail   | 191,508           | 10%                       | 8.9                  | 10.9                  | 170,317                | 208,933                |
| <b>Total</b>                                     | <b>696,125</b>    | <b>-</b>                  | <b>-</b>             | <b>-</b>              | <b>1,147,654</b>       | <b>1,160,582</b>       |
| <b>Energy Savings (Baseline minus Mitigated)</b> |                   |                           |                      |                       | <b>59,507</b>          | <b>105,331</b>         |

### Measure BE-3: Commercial Indoor Lighting

This measure estimates the reduction in electricity-related emissions resulting from indoor and outdoor light retrofits within commercial land uses. Baseline lighting electricity loads per square foot per non-residential use type were identified using CEC's Commercial End Use Survey data for Forecast Climate Zone 3 (see Table B-3).

The measure assumes that indoor lighting retrofits would occur at a performance level identified within the State's *Database for Energy Efficient Resources*. For 2020, the County assumes that 10% of total community-wide nonresidential square footage would implement a 40% indoor lighting load reduction. All non-residential uses (office, retail, and warehouse) are included in these calculations. Participation rates also reflect the assumption that State and federal light bulb efficiency standards (i.e. Energy Independence and Security Act of 2007) will assist in the implementation of this measure.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | 10% of non-residential buildings reduce indoor lighting load by 40% | 24 MT CO <sub>2</sub> e/yr              | <i>Baseline Energy Consumption: Commercial End Use Survey, CEC, 2006</i><br><i>Energy Savings from Retrofit Packages: CEC/CPCU Database for Energy Efficient Resources, 2005</i><br><i>Participation Rates: Shasta County, 2011</i> |

**Table B-3**  
**Indoor and Exterior Lighting Energy**

| Commercial Use Type | Baseline (kWh/SF/Year) | Mitigated (kWh/SF/Year) |
|---------------------|------------------------|-------------------------|
| Grocery             | 36.27                  | 33.31                   |
| Health              | 15.04                  | 13.54                   |
| Lodging             | 10.07                  | 9.44                    |
| Large Office        | 14.20                  | 12.62                   |
| Restaurant          | 33.25                  | 30.81                   |
| Retail              | 10.06                  | 8.43                    |
| School              | 8.82                   | 7.63                    |
| Small Office        | 9.40                   | 8.26                    |
| Warehouse (All)     | 22.67                  | 21.55                   |

Source: CEC 2006

### Measure BE-4: Energy Efficient Appliances

This measure estimates the reduction in electricity-related emissions resulting from installing energy-efficient appliances in new and existing residential units. This measure focuses on installation of energy-efficient refrigerators, clothes washers, and dishwashers. The CAPCOA report “*Quantifying Greenhouse Gas Mitigation Measures*” provides a methodology for calculating the electricity reductions associated with the installation of energy-efficient refrigerators, clothes washers, and dishwashers. Participation rates were selected on the assumption that State and utility outreach programs will increase the market share of ENERGY STAR appliances above current levels. Baseline market share values from a *Northwestern Energy Alliance* study indicate that approximately 33% of consumers purchase ENERGY STAR refrigerators, 83% purchase ENERGY STAR dishwashers, and 36% purchase ENERGY STAR clothes washers. The study shows a strong trend of increasing ENERGY STAR appliance market share over the past decade. For 2020, the County assumes that additional outreach and rebates will further increase the ENERGY STAR appliance market share in the unincorporated county. For new residential units, the measure assumes use of energy-efficient refrigerators and clothes washers will increase to a market share of 40% and use of energy-efficient dishwashers will increase to a market share of 70%. The County assumes that 20% of existing residential units will install energy-efficient refrigerators, clothes washers, and dishwashers.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | New homes install ENERGY STAR appliances at the following rates: 40% refrigerators, 40% clothes washers, and 70% dishwashers      | 1,443 MT CO <sub>2</sub> e/yr           | <i>Quantification Methodology: Energy Efficient Appliance Reduction: CAPCOA. 2010 (August). Quantifying Greenhouse Gas Mitigation Measures. Available: &lt;<a href="http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf">http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf</a>&gt;.</i> |
|      | Existing homes replace ENERGY STAR appliances at the following rates: 20% refrigerators, 20% clothes washers, and 20% dishwashers |   | <i>Participation Rates: ENERGY STAR Consumer Products Program: Market Progress Evaluation Report. Prepared by KEMA, Inc. July 24, 2007. Prepared for Northwestern Energy Efficiency Alliance.</i>   |



### Measure BE-5: Smart Grid Integration

This measure estimates the reduction in electricity-related emissions resulting from integration of Smart Grid technologies in new and existing residential and commercial land uses. Literature indicates that integration of Smart Grid technologies reduces electricity use by more than 5% in existing residential and commercial buildings and 6% in new residential and commercial buildings. For 2020, the measure assumes that 30% of all new residential buildings and 10% of existing residential and commercial buildings will integrate Smart Grid technologies.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | 10% of existing residential and commercial customers adopt smart-grid technology | 1,214 MT CO <sub>2</sub> e/yr           | <i>Smart Grid Reduction: SMART 2020: Enabling the low carbon economy in the information age, The Climate Group on behalf of the Global Sustainability Initiative (GeSI)</i>   |
|      | 30% of new residential and commercial customers adopt smart-grid technology      |   | <i>Estimating the Benefits of the GridWise Initiative Phase I Report Walter S. Baer, Brent Fulton, Sergej Mahnovski TR-160-PNNL, May 2004 Prepared for the Pacific Northwest National Laboratory</i><br><br><i>Participation Rates: Pacific Northwest National Laboratory, Estimating the Benefits of the GridWise Initiative Phase I Report Walter S. Baer, Brent Fulton, Sergej Mahnovski TR-160-PNNL, May 2004</i> |

### Measure BE-6: Solar Water Heaters

This measure quantifies natural gas and electricity-related emissions reductions resulting from the installation of solar hot water heaters in residential units and commercial buildings. Baseline water heating-related natural gas consumption levels per residential unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3. In addition, CEC data identifies the energy savings potential of solar hot water heaters for specific climates in California. The measure assumes that 40-67% of water-heating natural gas can be reduced through the use of solar hot water heaters. The measure assumes that 5% of all residential units (i.e., single family and multi-family) and 5% of all commercial buildings will install solar hot water heaters to meet their hot water demands. Care should be taken to avoid double-counting between a solar hot water heater installed to help new residential units achieve the building code-mandated energy efficiency performance and solar hot water heaters installed in excess of that requirement. Table B-4 provides the assumptions used to quantify reductions from solar water heaters.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | 5% each of single-family residential buildings, multi-family residential buildings, and non-residential buildings install a solar hot water system | 886 MT CO <sub>2</sub> e/yr             | <i>Baseline Hot Water Natural Gas Consumption: Residential Appliance Saturation Survey, CEC, 2010</i><br><br><i>Solar Fraction: Solar Water Heating CEC 2013 Title 24 Pre-rulemaking Workshop, California Energy Commission, June 9, 2011</i><br><br><i>Solar Insolation: National Renewable Energy Laboratory Renewable Resource Data Center, 2011</i><br><br><i>PV Participation Rates: Shasta County, 2012</i> |

**Table B-4**  
**Solar Water Heaters – 2020**

| <b>Residential Units</b>    |                 |   |  |   |                                       |                                |
|-----------------------------|-----------------|---|--|---|---------------------------------------|--------------------------------|
|                             | Units<br>(2020) | Hot Water<br>Heater Energy<br>per Unit<br>(therms/year) | Solar Water<br>Heater<br>Effectiveness | Energy Savings<br>per Unit<br>(therms/year) | Participation<br>Rate<br>(% of units) | Total Savings<br>(therms/year) |
| Single Family               | 20,361          | 196   | 67%                                    | 131.54                                      | 5%                                    | 133,907                        |
| Townhouse                   | 259             | 170   | 67%                                    | 114.15                                      | 5%                                    | 1,477                          |
| 2-4 unit<br>apartment       | 396             | 135   | 59%                                    | 79.65                                       | 5%                                    | 1,576                          |
| 5+ unit<br>apartment        | 187             | 84  | 59%                                    | 49.30                                       | 5%                                    | 460                            |
| <b>Total</b>                | <b>21,202</b>   | -   | -                                      | -   | -                                     | <b>137,419</b>                 |
| <b>Commercial Buildings</b> |                 |   |  |   |                                       |                                |
|                             | SQFT<br>(2020)  | Hot Water<br>Heater Energy<br>per SQFT<br>(kBtu/year)   | Solar Water<br>Heater<br>Effectiveness | Energy Savings<br>per SQFT<br>(kBtu/year)   | Participation<br>Rate<br>(% of sqft)  | Total Savings<br>(kBtu/year)   |
| All Office                  | 165,122         | 3.22  | 50%                                    | 1.58  | 5%                                    | 13,014                         |
| All Warehouse               | 311,850         | 0.00  | 50%                                    | 0.00  | 5%                                    | 0.0                            |
| Grocery                     | 31,605          | 0.00  | 50%                                    | 0.00  | 5%                                    | 0.0                            |
| Health                      | 35,085          | 17.34   | 50%                                    | 8.49  | 5%                                    | 14,902                         |
| Large Office                | 14,802          | 6.94  | 50%                                    | 3.40  | 5%                                    | 2,518                          |
| Restaurant                  | 34,078          | 29.95   | 50%                                    | 14.67                                       | 5%                                    | 25,001                         |
| Retail                      | 224,876         | 1.91  | 50%                                    | 0.94  | 5%                                    | 10,549                         |
| <b>Total</b>                | <b>817,417</b>  | -   | -                                      | -   | -                                     | <b>65,985</b>                  |

### Measure BE-7: Solar Photovoltaic Systems

This measure estimates the reduction in electricity-related emissions resulting from installation of grid connected photovoltaic (PV) systems in residential and commercial uses. The measure uses National Renewable Energy Laboratory solar insolation data specific to Shasta County's geographic location and climate. For 2020, it was assumed that approximately 10% of single-family and town-home units would install 3-kilowatt grid-connected PV systems. It was also assumed that the County would install 6.5 MW of additional PV systems. See Table B-5 for calculations and assumptions associated with this measure.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | 10% of single-family residential units install a rooftop PV system | 6,315 MT CO <sub>2</sub> e/yr           | <i>Solar Insolation: National Renewable Energy Laboratory Renewable Resource Data Center, 2011</i>                        |
|      | County government installs 6.5 MW of solar power                   |   | <i>Participation rates: Shasta County, 2012.</i><br><br><i>Building Data: Shasta County Assessor's Office parcel data</i> |

**Table B-5**  
**Solar PV Systems – 2020**

| Single-Family Residential                         |                     |                                      |                                  |
|---|---------------------|--------------------------------------|----------------------------------|
| Photovoltaic System Size per Unit (kW)            | Number of SFR Units | Generation Potential (kWh/sqft/year) | Electricity Generated (kWh/year) |
| 3.2   | 2062                | 166                                  | 10,940,971                       |
| Multi-Family Residential and Commercial           |                     |                                      |                                  |
| Total Photovoltaic System Capacity Installed (MW) | Area (sqft)         | Generation Potential (kWh/sqft/Year) | Electricity Generated (kWh/Year) |
| 6.5   | 500,000             | 166                                  | 10,778,169                       |
| <b>Total Electricity Generated (kWh/Year)</b>     |                     |                                      | <b>21,719,141</b>                |

### Measure W-1: Residential Fixture and Fittings Retrofit

This measure estimates the reduction in water-related emissions resulting from installation of high efficiency water fixtures and fixture fittings in residential buildings. The measure uses Residential End Uses of Water Study to estimate baseline (pre-retrofit) scenario indoor water demand. The measure then develops a mitigated (post-retrofit) scenario indoor water demand average using data from the Residential Indoor Water Conservation Study and participation rates estimated by Shasta County. The difference between the two scenarios is the amount of water reduced by implementation of the measure. For 2020, it was assumed that approximately 5% of residential units in the County would retrofit to highly efficient fixtures. The amount of water reduce was converted into GHG reduction estimate by multiplying the volume by an appropriate water intensity factor and electricity emissions factor..

See Tables B-6, B-7, B-8 and B-9 for assumptions and calculations used to quantify reductions from this measure.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources |
|------|--|---|---------|
| 2020 | 5% of residential households install high-efficiency toilets, showerheads, faucets, dishwashers, and clothes washers | 94 MT CO <sub>2</sub> e/yr              |         |

| Table B-6<br>Residential Indoor Water Use                  |                     |                |            |            |            |              |
|--|---------------------|----------------|------------|------------|------------|--------------|
|  | End Use (Mgal/year) |                |            |            |            |              |
|  | Toilet              | Clothes Washer | Shower     | Faucet     | Dishwasher | Total        |
| <b>Residential Indoor Water Use – Unmitigated Scenario</b> |                     |                |            |            |            |              |
| Single-Family  | 372                 | 273            | 223        | 186        | 25         | 1,079        |
| Multifamily  | 123                 | 90             | 74         | 62         | 8          | 357          |
| <b>Total</b>   | <b>495</b>          | <b>363</b>     | <b>297</b> | <b>248</b> | <b>33</b>  | <b>1,436</b> |
| <b>Residential Indoor Water Use – Mitigated Scenario</b>   |                     |                |            |            |            |              |
| Single-Family  | 167                 | 121            | 167        | 155        | 18         | 628          |
| Multifamily  | 55                  | 40             | 55         | 51         | 6          | 208          |
| <b>Total</b>   | <b>222</b>          | <b>161</b>     | <b>223</b> | <b>206</b> | <b>24</b>  | <b>836</b>   |
| <b>Residential Indoor Water Use – Water Conserved</b>      |                     |                |            |            |            |              |
| Single-Family  | 206                 | 152            | 56         | 31         | 7          | 451          |
| Multifamily  | 68                  | 50             | 18         | 10         | 2          | 149          |
| <b>Total</b>   | <b>274</b>          | <b>203</b>     | <b>74</b>  | <b>41</b>  | <b>9</b>   | <b>600</b>   |

Source: National Residential End Uses of Water Study, Alliance for Water Efficiency, American Water Works Association, and AWWA Research Foundation

**Table B-7**  
**Residential Indoor Water Use – End Uses**

| Fixture/Appliance | Units          | Existing Scenario | Mitigated Scenario |
|-------------------|----------------|-------------------|--------------------|
| Toilet            | gallons/flush  | 3.88              | 1.6                |
| Clothes Washer    | gallons/load   | 40.7              | 18                 |
| Shower            | gallons/minute | 2                 | 1.5                |
| Dishwasher        | gallons/cycle  | 8.9               | 6.5                |
| Faucet            | gallons/minute | 1.2               | 1                  |

**Table B-8**  
**Water Energy Intensity (kwh/Mgal)**

| Water Supply       | Supply & Conveyance | Treatment | Distribution | OUTDOOR TOTAL | Wastewater Treatment | INDOOR TOTAL |
|--------------------|---------------------|-----------|--------------|---------------|----------------------|--------------|
| North CA - Generic | 2,117               | 111       | 1,272        | 3,500         | 1,911                | 5,411        |

Source: CEC. 2006. Refining Estimates of Water-Related Energy Use in California. PIER Final Project Report. Prepared by Navigant Consulting, Inc. CEC-500-2006-118.

**Table B-9**  
**Electricity Emissions Factor**

| CO <sub>2</sub> (lbs/MWh) | CH <sub>4</sub> (lbs/MWh) | N <sub>2</sub> O (lbs/MWh) | CO <sub>2</sub> e (lbs/MWh) | CO <sub>2</sub> e lbs/kWh | CO <sub>2</sub> e MT/kWh |
|---------------------------|---------------------------|----------------------------|-----------------------------|---------------------------|--------------------------|
| 641.00                    | 0.000                     | 0.000                      | 641                         | 0.64100                   | 0.00029                  |

Source: PGE

### Measure SW-1: Lumber Waste Diversion Ordinance

An inventory of the community's organic waste was created using Cal Recycle waste volume and characterization data. Using the first-order decay methodology from the 2006 IPCC guidelines, fugitive methane emissions from the organic landfill waste were calculated for base-case and mitigated scenarios. This measure assumes that residential and commercial uses will divert 75% of construction/demolition waste (highlighted in blue in Tables B-10 and B-11) from landfills by 2020. This measure would apply to GHG emissions associated with new waste generated and would not apply to waste in place disposed prior to CAP implementation.

Calculations for this measure factored in the advanced methane recovery rate described in Measure SW-2 to avoid double counting emissions reductions.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | 100% of residential and commercial projects participate in 75% lumber waste diversion | 1,334 CO <sub>2</sub> e/yr              | <i>CalRecycle Waste Characterization Data, 2011</i><br><i>IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5 Chapter 3.</i> |

**Table B-10**  
**Baseline Degradable Organic Carbon Disposed**

**Commercial Waste – Baseline Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food  | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/<br>Demolition | Sludge/<br>Manure | Total  |
|------|-----------|--------------|------------------|--------------|-------|-------|--------|----------|--------|----------|---------|-----------------------------|-------------------|--------|
| 2008 | 26.0      | 202.5        | 377.1            | 207.0        | 484.7 | 20.4  | 79.7   | 76.8     | 569.9  | 191.2    | 100.7   | 42.3                        | 0.0               | 2378.2 |
| 2009 | 26.2      | 203.8        | 379.5            | 208.3        | 487.8 | 20.5  | 80.2   | 77.3     | 573.5  | 192.4    | 101.3   | 42.6                        | 0.0               | 2393.3 |
| 2010 | 26.3      | 205.1        | 381.9            | 209.6        | 490.9 | 20.6  | 80.7   | 77.7     | 577.1  | 193.6    | 102.0   | 42.9                        | 0.0               | 2408.4 |
| 2011 | 26.5      | 206.4        | 384.3            | 211.0        | 494.0 | 20.8  | 81.2   | 78.2     | 580.7  | 194.9    | 102.6   | 43.2                        | 0.0               | 2423.7 |
| 2012 | 26.7      | 207.7        | 386.7            | 212.3        | 497.1 | 20.9  | 81.7   | 78.7     | 584.4  | 196.1    | 103.3   | 43.4                        | 0.0               | 2439.0 |
| 2013 | 26.8      | 209.0        | 389.2            | 213.6        | 500.3 | 21.0  | 82.2   | 79.2     | 588.1  | 197.3    | 103.9   | 43.7                        | 0.0               | 2454.4 |
| 2014 | 27.0      | 210.3        | 391.6            | 215.0        | 503.4 | 21.2  | 82.7   | 79.7     | 591.8  | 198.6    | 104.6   | 44.0                        | 0.0               | 2470.0 |
| 2015 | 27.2      | 211.7        | 394.1            | 216.3        | 506.6 | 21.3  | 83.2   | 80.2     | 595.6  | 199.8    | 105.2   | 44.3                        | 0.0               | 2485.6 |
| 2016 | 27.3      | 213.0        | 396.6            | 217.7        | 509.8 | 21.4  | 83.8   | 80.7     | 599.3  | 201.1    | 105.9   | 44.5                        | 0.0               | 2501.3 |
| 2017 | 27.5      | 214.4        | 399.1            | 219.1        | 513.0 | 21.6  | 84.3   | 81.2     | 603.1  | 202.4    | 106.6   | 44.8                        | 0.0               | 2517.1 |
| 2018 | 27.7      | 215.7        | 401.7            | 220.5        | 516.3 | 21.7  | 84.8   | 81.8     | 606.9  | 203.6    | 107.2   | 45.1                        | 0.0               | 2533.1 |
| 2019 | 27.9      | 217.1        | 404.2            | 221.9        | 519.6 | 21.8  | 85.4   | 82.3     | 610.8  | 204.9    | 107.9   | 45.4                        | 0.0               | 2549.1 |
| 2020 | 28.0      | 218.5        | 406.8            | 223.3        | 522.8 | 22.0  | 85.9   | 82.8     | 614.7  | 206.2    | 108.6   | 45.7                        | 0.0               | 2565.2 |

**Residential Waste – Baseline Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food   | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/<br>Demolition | Sludge/<br>Manure | Total  |
|------|-----------|--------------|------------------|--------------|--------|-------|--------|----------|--------|----------|---------|-----------------------------|-------------------|--------|
| 2008 | 66.3      | 237.5        | 191.3            | 302.6        | 1021.6 | 39.4  | 95.4   | 40.1     | 295.4  | 279.3    | 326.7   | 24.0                        | 1.0               | 2920.6 |
| 2009 | 66.7      | 239.0        | 192.5            | 304.5        | 1028.1 | 39.6  | 96.0   | 40.3     | 297.2  | 281.1    | 328.7   | 24.1                        | 1.0               | 2939.1 |
| 2010 | 67.1      | 240.5        | 193.7            | 306.5        | 1034.6 | 39.9  | 96.7   | 40.6     | 299.1  | 282.9    | 330.8   | 24.3                        | 1.1               | 2957.7 |
| 2011 | 67.6      | 242.1        | 194.9            | 308.4        | 1041.1 | 40.1  | 97.3   | 40.8     | 301.0  | 284.6    | 332.9   | 24.4                        | 1.1               | 2976.4 |
| 2012 | 68.0      | 243.6        | 196.1            | 310.4        | 1047.7 | 40.4  | 97.9   | 41.1     | 302.9  | 286.4    | 335.0   | 24.6                        | 1.1               | 2995.2 |
| 2013 | 68.4      | 245.1        | 197.4            | 312.3        | 1054.4 | 40.6  | 98.5   | 41.4     | 304.8  | 288.3    | 337.1   | 24.8                        | 1.1               | 3014.2 |
| 2014 | 68.9      | 246.7        | 198.6            | 314.3        | 1061.0 | 40.9  | 99.1   | 41.6     | 306.8  | 290.1    | 339.3   | 24.9                        | 1.1               | 3033.2 |
| 2015 | 69.3      | 248.3        | 199.9            | 316.3        | 1067.7 | 41.2  | 99.7   | 41.9     | 308.7  | 291.9    | 341.4   | 25.1                        | 1.1               | 3052.4 |
| 2016 | 69.7      | 249.8        | 201.1            | 318.3        | 1074.5 | 41.4  | 100.4  | 42.2     | 310.7  | 293.8    | 343.6   | 25.2                        | 1.1               | 3071.8 |
| 2017 | 70.2      | 251.4        | 202.4            | 320.3        | 1081.3 | 41.7  | 101.0  | 42.4     | 312.6  | 295.6    | 345.7   | 25.4                        | 1.1               | 3091.2 |
| 2018 | 70.6      | 253.0        | 203.7            | 322.3        | 1088.1 | 41.9  | 101.7  | 42.7     | 314.6  | 297.5    | 347.9   | 25.5                        | 1.1               | 3110.7 |
| 2019 | 71.1      | 254.6        | 205.0            | 324.4        | 1095.0 | 42.2  | 102.3  | 43.0     | 316.6  | 299.4    | 350.1   | 25.7                        | 1.1               | 3130.4 |
| 2020 | 71.5      | 256.2        | 206.3            | 326.4        | 1102.0 | 42.5  | 102.9  | 43.2     | 318.6  | 301.3    | 352.3   | 25.9                        | 1.1               | 3150.2 |

**Table B-11**  
**Mitigated Degradable Organic Carbon Disposed**

**Commercial Waste – Mitigated Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food  | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/ Demolition | Sludge/ Manure | Total  |
|------|-----------|--------------|------------------|--------------|-------|-------|--------|----------|--------|----------|---------|--------------------------|----------------|--------|
| 2008 | 26.0      | 202.5        | 377.1            | 207.0        | 484.7 | 20.4  | 79.7   | 76.8     | 142.5  | 191.2    | 100.7   | 42.3                     | 0.0            | 1950.8 |
| 2009 | 26.2      | 203.8        | 379.5            | 208.3        | 487.8 | 20.5  | 80.2   | 77.3     | 143.4  | 192.4    | 101.3   | 42.6                     | 0.0            | 1963.2 |
| 2010 | 26.3      | 205.1        | 381.9            | 209.6        | 490.9 | 20.6  | 80.7   | 77.7     | 144.3  | 193.6    | 102.0   | 42.9                     | 0.0            | 1975.6 |
| 2011 | 26.5      | 206.4        | 384.3            | 211.0        | 494.0 | 20.8  | 81.2   | 78.2     | 145.2  | 194.9    | 102.6   | 43.2                     | 0.0            | 1988.1 |
| 2012 | 26.7      | 207.7        | 386.7            | 212.3        | 497.1 | 20.9  | 81.7   | 78.7     | 146.1  | 196.1    | 103.3   | 43.4                     | 0.0            | 2000.7 |
| 2013 | 26.8      | 209.0        | 389.2            | 213.6        | 500.3 | 21.0  | 82.2   | 79.2     | 147.0  | 197.3    | 103.9   | 43.7                     | 0.0            | 2013.3 |
| 2014 | 27.0      | 210.3        | 391.6            | 215.0        | 503.4 | 21.2  | 82.7   | 79.7     | 148.0  | 198.6    | 104.6   | 44.0                     | 0.0            | 2026.1 |
| 2015 | 27.2      | 211.7        | 394.1            | 216.3        | 506.6 | 21.3  | 83.2   | 80.2     | 148.9  | 199.8    | 105.2   | 44.3                     | 0.0            | 2038.9 |
| 2016 | 27.3      | 213.0        | 396.6            | 217.7        | 509.8 | 21.4  | 83.8   | 80.7     | 149.8  | 201.1    | 105.9   | 44.5                     | 0.0            | 2051.8 |
| 2017 | 27.5      | 214.4        | 399.1            | 219.1        | 513.0 | 21.6  | 84.3   | 81.2     | 150.8  | 202.4    | 106.6   | 44.8                     | 0.0            | 2064.8 |
| 2018 | 27.7      | 215.7        | 401.7            | 220.5        | 516.3 | 21.7  | 84.8   | 81.8     | 151.7  | 203.6    | 107.2   | 45.1                     | 0.0            | 2077.9 |
| 2019 | 27.9      | 217.1        | 404.2            | 221.9        | 519.6 | 21.8  | 85.4   | 82.3     | 152.7  | 204.9    | 107.9   | 45.4                     | 0.0            | 2091.0 |
| 2020 | 28.0      | 218.5        | 406.8            | 223.3        | 522.8 | 22.0  | 85.9   | 82.8     | 153.7  | 206.2    | 108.6   | 45.7                     | 0.0            | 2104.2 |

**Residential Waste – Mitigated Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food   | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/ Demolition | Sludge/ Manure | Total  |
|------|-----------|--------------|------------------|--------------|--------|-------|--------|----------|--------|----------|---------|--------------------------|----------------|--------|
| 2008 | 66.3      | 237.5        | 191.3            | 302.6        | 1021.6 | 39.4  | 95.4   | 40.1     | 73.8   | 279.3    | 326.7   | 24.0                     | 1.0            | 2699.1 |
| 2009 | 66.7      | 239.0        | 192.5            | 304.5        | 1028.1 | 39.6  | 96.0   | 40.3     | 74.3   | 281.1    | 328.7   | 24.1                     | 1.0            | 2716.2 |
| 2010 | 67.1      | 240.5        | 193.7            | 306.5        | 1034.6 | 39.9  | 96.7   | 40.6     | 74.8   | 282.9    | 330.8   | 24.3                     | 1.1            | 2733.3 |
| 2011 | 67.6      | 242.1        | 194.9            | 308.4        | 1041.1 | 40.1  | 97.3   | 40.8     | 75.3   | 284.6    | 332.9   | 24.4                     | 1.1            | 2750.6 |
| 2012 | 68.0      | 243.6        | 196.1            | 310.4        | 1047.7 | 40.4  | 97.9   | 41.1     | 75.7   | 286.4    | 335.0   | 24.6                     | 1.1            | 2768.0 |
| 2013 | 68.4      | 245.1        | 197.4            | 312.3        | 1054.4 | 40.6  | 98.5   | 41.4     | 76.2   | 288.3    | 337.1   | 24.8                     | 1.1            | 2785.6 |
| 2014 | 68.9      | 246.7        | 198.6            | 314.3        | 1061.0 | 40.9  | 99.1   | 41.6     | 76.7   | 290.1    | 339.3   | 24.9                     | 1.1            | 2803.2 |
| 2015 | 69.3      | 248.3        | 199.9            | 316.3        | 1067.7 | 41.2  | 99.7   | 41.9     | 77.2   | 291.9    | 341.4   | 25.1                     | 1.1            | 2820.9 |
| 2016 | 69.7      | 249.8        | 201.1            | 318.3        | 1074.5 | 41.4  | 100.4  | 42.2     | 77.7   | 293.8    | 343.6   | 25.2                     | 1.1            | 2838.8 |
| 2017 | 70.2      | 251.4        | 202.4            | 320.3        | 1081.3 | 41.7  | 101.0  | 42.4     | 78.2   | 295.6    | 345.7   | 25.4                     | 1.1            | 2856.7 |
| 2018 | 70.6      | 253.0        | 203.7            | 322.3        | 1088.1 | 41.9  | 101.7  | 42.7     | 78.6   | 297.5    | 347.9   | 25.5                     | 1.1            | 2874.8 |
| 2019 | 71.1      | 254.6        | 205.0            | 324.4        | 1095.0 | 42.2  | 102.3  | 43.0     | 79.1   | 299.4    | 350.1   | 25.7                     | 1.1            | 2893.0 |
| 2020 | 71.5      | 256.2        | 206.3            | 326.4        | 1102.0 | 42.5  | 102.9  | 43.2     | 79.6   | 301.3    | 352.3   | 25.9                     | 1.1            | 2911.3 |



### Measure SW-2: Methane Recovery

This measure estimates the reductions resulting from installation of a landfill gas recovery system at the West Central Landfill in order to comply with an adopted ARB regulation described as a discrete early action GHG emissions reduction measure in the AB 32 *Climate Change Scoping Plan*. Two landfills currently accept municipal solid waste (MSW) in Shasta County. The Anderson Landfill already has a landfill gas recovery system in place, and no efficiency upgrades are anticipated at this time. Table B-12 shows the percentage of total waste sent to each landfill that is attributed to unincorporated Shasta County. It also shows the baseline and mitigated methane capture rate scenarios upon which emissions reductions were calculated.

This measure would apply to GHG emissions associated with new waste generated and waste-in-place disposed prior to GGRP implementation.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | Methane recovery efficiency at West Central Landfill improved from 0% to 75% | 16,360 MT CO <sub>2</sub> e/yr          | <i>CalRecycle Waste Characterization Data, 2011</i><br><i>IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5 Chapter 3.</i> |

| Table B-12<br>Waste Contributions per Landfill and Methane Capture Rates |   |                                      |  |
|--|---|--------------------------------------|--|
| Landfill   | Proportion of Total Refuse Received at Landfill from Unincorporated Shasta County | BAU Scenario – Methane Capture Rates | Mitigated Scenario – Methane Capture Rates |
| West Central Landfill  | 24.00%  | 0%                                   | 75%  |
| Anderson Landfill  | 22.00%  | 80%                                  | 80%  |
| Benton Landfill  | 0.00%   | 90%                                  | 90%  |

Source: Ascent Environmental, 2012

### Measure T-1: Bicycle Lane Expansion

This measure quantifies reductions resulting from increasing Shasta Lake's bicycle mode share through expansion of its bicycle infrastructure, primarily Class I and II bicycle facilities. This measure assumes the construction of 20.0 miles of new Class I and II facilities by 2020. Emissions reductions come from VMT differences between a BAU scenario and a mitigated scenario (see Table B-13). The CAPCOA methodology was used to help quantify VMT reductions based on the proposed bicycle infrastructure improvements. A mode share study conducted by Dill and Carr was used to help define assumptions regarding how additional bicycle lanes translate into increased bicycle mode share (see Table B-14). The methodology assumes that the ratio of additional bicycle lane mileage per community area correlates to increased bicycle mode share, above levels reported in the 2010 US Census.

| Year | Progress Indicators                     | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | 43.0 miles of bicycle paths constructed | 127 MT CO <sub>2</sub> e/yr             | <p>CAPCOA. <i>Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emissions Reductions from Greenhouse Gas Mitigation Measures</i>. August, 2010.</p> <p>Dill, J and Carr, T. <i>Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them</i>. 2003.</p> |

| Table B-13   |                          |                            |
|--|--------------------------|----------------------------|
| Communitywide VMT Reductions – Bicycle Infrastructure Improvements |                          |                            |
| BAU Scenario – Vehicles Miles Traveled                             |                          |                            |
|  | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline   | 429,894,759              | 22,507,579                 |
| Diesel   | 45,127,074               | 7,051,105                  |
| Total  | 475,021,833              | 29,558,684                 |
| Mitigated Scenario – Vehicles Miles Traveled                       |                          |                            |
|  | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline   | 429,695,818              | 22,497,163                 |
| Diesel   | 45,106,191               | 7,047,842                  |
| Total  | 474,802,009              | 29,545,006                 |
| BAU minus Mitigated Scenario                                       |                          |                            |
|  | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline   | 198,941                  | 10,416                     |
| Diesel   | 20,883                   | 3,263                      |
| <b>Total</b>   | <b>219,824</b>           | <b>13,679</b>              |

**Table B-14**  
**Bicycle Infrastructure Assumptions**

|  |      |
|--|------|
| Land Area of Community (sq miles)  | 50   |
| <b>Existing Scenario</b>   |      |
| Bike Lanes (Class I and II)  | 4    |
| Bike Lanes/sq mile   | 0.08 |
| <b>Mitigated Scenario</b>  |      |
| Bike Lanes (Class I and II)  | 43   |
| Bike Lanes/sq mile   | 0.86 |
| % Increase in Bicycle Commute Mode Share for each Additional Mile of Bike Lane/sq mile | 1.0% |
| Mitigated Bicycle Commute Mode Share   | 2.3% |

### Measure T-2: Commute Trip Reduction

This measure estimates the impact of transportation demand management programs in unincorporated Shasta County, based on the assembled research. The estimated vehicle trip reductions apply to commute trips for employees of those businesses covered by the TDM program. See Table B-15 for calculations and assumptions related to this measure.

**Rideshare promotion** – A study conducted by Reid Ewing concluded that ridesharing programs can reduce daily vehicle commute trips to specific worksites by 5-15%, and up to 20% or more if implemented with parking pricing. In this measure we assume 3% of commute trips shifted from SOV to other modes.

**Telecommuting/alternative work schedule** – A Center for Urban Transportation Research survey found vehicle trips reduced by up to 8% if 50% of employees are participating in alternative work programs, making it among the most effective commute trip reduction strategies considered in that study. A National Association of Regional Councils analysis estimates that compressed work weeks can reduce up to 0.6% of VMT and up to 0.5% of vehicle trips in a region. In this measure we assume telecommuting/compressed work will result in 3% of commute trips shifted from SOV to other modes.

**Subsidized transit fares** – Various studies of the impact of subsidized transit passes indicate reductions in drive-alone mode share of 4% to 42%, with an average reduction of 19%. For Anderson we estimate that a likely percent reduction in vehicle trips from transit pass subsidies would be 6% for those businesses offering passes.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources                                 |
|------|---|---|---|
| 2020 | 5% of employees in unincorporated Shasta County commute via carpool or public transit | 70 MT CO <sub>2</sub> e/yr              | VMT reduction assumptions: AECOM, 2012. |

| Table B-15<br>TDM Measure Calculations and Assumptions                             |                                |   |                            |   |   |                        |   |
|--|--------------------------------|---|----------------------------|---|---|------------------------|---|
| Percent Reduction in VMT from Implementation of TDM Measures                       |                                |   |                            |   |   |                        |   |
|  | VMT Split by Vehicle Fuel Type |   |                            | Reduction in Total VMT by Vehicle Fuel Type |   |                        |   |
|  | Gasoline                       | Diesel                                    |                            | Gasoline                                    |   | Diesel                 |   |
| Reduction in Total VMT   | 90.5%                          | 9.5%                                      |                            | 0.026%                                      |   | 0.003%                 |   |
| 2020 Mitigated Scenario – Vehicle Miles Traveled and Emissions                     |                                |   |                            |   |   |                        |   |
|  | Community Travel (miles)       | Weighted Average Fuel Efficiency (mi/gal) | Fuel Consumption (gallons) | Emission Factors                            |   |                        | Total Emissions (MT CO <sub>2</sub> e/Year) |
|  |                                |   |                            | CO <sub>2</sub> (g/gal)                     | N <sub>2</sub> O (g/mi)                     | CH <sub>4</sub> (g/mi) |   |
| Gasoline VMT (miles)   | 380,179,434                    | 19.1                                      | 19,904,682                 | 8,599                                       | 0.0700                                      | 0.0620                 | 179,577                                     |
| Diesel VMT (miles)   | 39,908,338                     | 6.4                                       | 6,235,678                  | 10,092                                      | 0.0500                                      | 0.0420                 | 63,559                                      |
| Total  | 420,087,772                    |   | 26,140,360                 |   |   |                        | 243,136                                     |
| Calculation of VMT, Fuel Consumption, and GHG Emission Reduction from TDM Measures |                                |   |                            |   |   |                        |   |
|  | Community Travel (miles)       | Fuel Consumption (gallons)                |                            |   | Total Emissions (MT CO <sub>2</sub> e/Year) |                        |   |
| Gasoline VMT (miles)   | 109,414.5                      | 5,729                                     |                            |   | 52  |                        |   |
| Diesel VMT (miles)   | 11,485.5                       | 1,795                                     |                            |   | 18  |                        |   |
| Total  | 120,900                        | 7,523                                     |                            |   | 70.0  |                        |   |

### Measure GI-1: Urban Forest

This measure is based on extrapolating the carbon potential of a typical tree planting palette. The City's goal is that 400 new trees will be planted by public and private development by 2020. Carbon sequestration rates specific to the species and age of the planted trees were collected from the Center for Urban Forest Research (CUFR) Tree Carbon Calculator and used to calculate the annual sequestration potential of the trees from 2008 – 2020. For purposes of the calculation it was assumed that an equal number of trees will be planted each year between 2008 and 2020. See Tables B-16 and B-17 for carbon sequestration assumptions used in this measure.

| Year        | Progress Indicators          | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|-------------|------------------------------|---|---|
| <b>2020</b> | 400 shade trees are planted. | 30 MT CO <sub>2</sub> e/yr              | The Center for Urban Forest Research (CUFR) Tree Carbon Calculator. |

**Table B-16**  
**Carbon Sequestration of Trees Planted 2012-2020 in 2020**

| Year                            | Trees Planted per Year | Years of Growth | GHG Emissions Reductions (lbs CO <sub>2</sub> e in 2020) | Carbon Sequestration (MT CO <sub>2</sub> e in 2020) |
|---------------------------------|------------------------|-----------------|--|---|
| 2012                            | 50                     | 0               | 17,341   | 7.9   |
| 2013                            | 50                     | 1               | 14,310   | 6.5   |
| 2014                            | 50                     | 2               | 11,481   | 5.2   |
| 2015                            | 50                     | 3               | 8,836  | 4.0   |
| 2016                            | 50                     | 4               | 6,359  | 2.9   |
| 2017                            | 50                     | 5               | 4,317  | 2.0   |
| 2018                            | 50                     | 6               | 2,620  | 1.2   |
| 2019                            | 50                     | 7               | 1,200  | 0.5   |
| <b>Cumulative Total in 2020</b> | <b>400</b>             | <b>NA</b>       | <b>66,463</b>  | <b>30.1</b>   |

Note: Assumes age of tree at planting = 4 years

**Table B-17**  
**Carbon Sequestration per Species per Year of growth**

| Species | Camphor Tree<br><i>Cinnamomum camphora</i> | Modesto Ash<br><i>Fraxinus vlutina</i> | Sweetgum<br><i>Liquidambar styraciflua</i> | Roble Negro<br><i>Quercus ilex</i> | Turkish Pine<br><i>Pinus brutia</i> | AVERAGE              |
|---------|--|--|--|------------------------------------|-------------------------------------|----------------------|
| Age     | per<br>year<br>Total<br>20%                | per<br>year<br>Total<br>20%            | per<br>year<br>Total<br>20%                | per<br>year<br>Total<br>20%        | per<br>year<br>Total<br>20%         | per<br>year<br>Total |
| 1       | 0.6 0.6                                    | 1.5 1.5                                | 0.2 0.2                                    | 0.0 0.0                            | 0.6 0.6                             | 0.3 0.6              |
| 2       | 0.6 1.2                                    | 13.7 15.2                              | 0.2 0.4                                    | 0.5 0.5                            | 0.6 1.2                             | 1.4 3.7              |
| 3       | 2.6 3.8                                    | 30.0 45.2                              | 0.2 0.6                                    | 3.1 3.6                            | 4.9 6.1                             | 3.7 11.9             |
| 4       | 6.0 9.8                                    | 43.7 88.9                              | 0.7 1.3                                    | 8.0 11.6                           | 12.3 18.4                           | 6.4 26.0             |
| 5       | 10.3 20.1                                  | 54.3 143.2                             | 1.7 3.0                                    | 14.3 25.9                          | 21.5 39.9                           | 9.3 46.4             |
| 6       | 13.1 33.2                                  | 58.6 201.8                             | 2.5 5.5                                    | 18.3 44.2                          | 27.5 67.4                           | 10.9 70.4            |
| 7       | 16.6 49.8                                  | 63.2 265.0                             | 3.7 9.2                                    | 23.5 67.7                          | 35.1 102.4                          | 12.9 98.8            |
| 8       | 21.2 71.0                                  | 68.2 333.2                             | 5.4 14.5                                   | 30.1 97.9                          | 44.8 147.2                          | 15.4 132.8           |
| 9       | 26.9 97.9                                  | 73.6 406.8                             | 7.9 22.4                                   | 38.6 136.5                         | 57.2 204.3                          | 18.6 173.6           |
| 10      | 34.2 132.1                                 | 79.4 486.2                             | 11.6 34.0                                  | 49.5 186.0                         | 73.0 277.3                          | 22.5 223.1           |
| 11      | 37.6 169.7                                 | 80.7 566.9                             | 13.7 47.7                                  | 54.2 240.2                         | 78.4 355.7                          | 24.0 276.0           |
| 12      | 41.3 211.0                                 | 81.9 648.8                             | 16.1 63.8                                  | 59.4 299.6                         | 84.1 439.9                          | 25.7 332.6           |

Source: Center for Urban Forest Research, CUFR Model, USDA, 2008

## Statewide Measures Reductions

For climate action planning purposes, baseline GHG emissions are projected under a business-as-usual scenario to a future year, assuming that conditions and consumption rates occurring in the baseline year would continue. However, even without local climate action planning, statewide measures and regulations would affect future business-as-usual GHG emissions.

Estimates of the local effect of statewide reduction measures should be conservative to avoid overestimating GHG reductions. In many cases, the regulation may not have the same effectiveness at a particular local level as it does on a statewide level. Furthermore, some regulations that affect certain industries or practices may occur more frequently in one jurisdiction than another and therefore various levels of statewide reductions would be anticipated in each jurisdiction. Therefore, AECOM has selected the following statewide reduction measures that would create reasonably foreseeable emissions reductions attributable to Shasta Lake at a local level.

## Renewable Portfolio Standard

Executive Order S-21-09 established a statewide renewable energy portfolio target of 33% by year 2020. Therefore, California utilities, including PG&E, will increase their renewable portfolio standard (RPS) to at least 33% by year 2020. The GHG reductions associated with the RPS were estimated by evaluating PG&E's RPS increase from baseline year 2008 to year 2020 and 2035. PG&E's year 2008 baseline RPS-eligible electricity sources were determined to be approximately 12%. However, PG&E also maintains other renewable electricity sources that don't qualify for RPS (e.g., large hydroelectric sources); however, would also not generate GHG emissions. These non-RPS eligible sources account for approximately 20% of PG&E's year 2008 baseline electricity portfolio. Therefore, the anticipated change from baseline year 2008 to year 2020 is a 21% increase in RPS sources (i.e.,  $33\% - 12\% = 21\%$ ). Assuming that PG&E will only focus on RPS-eligible sources, year 2020 renewable portfolio would be approximately 53% (i.e.,  $33\% \text{ RPS} + 20\% \text{ non-RPS} = 53\%$ ). Although it is likely that PG&E would add additional RPS and non-RPS sources between 2020 and 2035, or that new regulations would require an increase in RPS sources, for a conservative analysis, the projections assume the 33% RPS and 20% non-RPS eligible renewable sources remained constant between 2020 and 2035. Table B-18 presents calculations used to estimate GHG emission reductions associated with the RPS.



| <b>Table B-18</b><br><b>Communitywide Renewable Portfolio Standard Calculations</b>                             |             |             |
|---|-------------|-------------|
| <b>Parameter</b>  | <b>2020</b> | <b>2035</b> |
| Total Business-As-Usual Electricity Emissions (MT CO <sub>2</sub> e/yr)   | 148,409     | 148,409     |
| Business-As-Usual RPS <sup>1</sup>  | 12%         | 12%         |
| Target RPS  | 33%         | 33%         |
| Additional RPS Percent Increase   | 21%         | 21%         |
| Total Renewable, Non-Carbon Electricity Sources   | 53%         | 53%         |
| Total Electricity Emissions with RPS Target (MT CO <sub>2</sub> e/yr)<br>(Electricity BAU × (1-Additional RPS)) | 102,577     | 102,577     |
| Emission Reduction (MT CO <sub>2</sub> e/yr)  | 45,832      | 45,832      |

Notes: MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalent per year; BAU = business as usual; RPS = renewable portfolio standard

<sup>1</sup> Business-as-usual renewable portfolio standard (RPS) (year 2008) and non-RPS eligible resources were obtained from Pacific Gas and Electric.

Source: AECOM 2012

## Scoping Plan Transportation Measures

The AB 32 Climate Change Scoping Plan (Scoping Plan) has established several statewide measures that will contribute to California achieving its GHG reduction goal. Several statewide measures would affect the transportation-related business-as-usual emissions. In order to account for GHG reductions associated with Pavley I and the Low Carbon Fuel Standard (LCFS), the ARB-approved Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0 was used to estimate reductions from EMFAC2007 outputs (ARB 2010b). Table B-19 presents GHG emission reductions associated with Pavley I and the LCFS transportation measures.

The AB 32 Scoping Plan includes other transportation measures that would reduce motor vehicle emissions on a statewide level, which are not estimated in any ARB-approved models. AECOM has selected Heavy-Duty Vehicle Aerodynamic Efficiency, Light-Duty Vehicle Tire Pressure, and Pavley II as measures that can be reasonably assumed to be implemented and affect transportation emissions within Anderson. To estimate the local effect of these reductions, AECOM divided the anticipated transportation emission reductions associated with the Scoping Plan transportation measures by the ARB-projected 2020 transportation emissions to estimate the percent reduction in transportation emissions attributed to implementation of the Scoping Plan. The percent reduction achieved by these measures from the state's total transportation sector was applied to the City's business-as-usual transportation emissions. This method assumes that the City will achieve the same relative level of transportation emission reductions associated with transportation measures as the Scoping Plan assumes at the statewide level. Table B-20 presents calculations used to estimate GHG emission reductions associated with the Heavy-Duty Vehicle Aerodynamic Efficiency, Light-Duty Vehicle Tire Pressure, and Pavley II transportation measures.

**Table B-19**  
**Pavley I and Low Carbon Fuel Standard Emission Reductions**

| Transportation Measure   | Preferred Project<br>(MT CO <sub>2</sub> e/yr) |               |
|--------------------------|--|---------------|
|                          | 2020   | 2035          |
| Pavley I                 | 35,421   | 66,274        |
| Low Carbon Fuel Standard | 15,173   | 16,146        |
| <b>Total</b>             | <b>50,594</b>                                  | <b>82,420</b> |

Notes: MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalents per year.

Source: AECOM 2012, ARB 2010b

**Table B-20**  
**Communitywide Scoping Plan Measures Calculations**

| Energy Source and Year                                    | Statewide Total Emissions (MMT CO <sub>2</sub> e/yr) <sup>1</sup> | AB 32 Scoping Plan Reductions (MMT CO <sub>2</sub> e/yr) <sup>2</sup> | Percent Reduction | Unincorp. Shasta County Total Emissions (MT CO <sub>2</sub> e/yr) | Unincorp. Shasta County Total Emissions with Reduction Measure (MT CO <sub>2</sub> e/yr) | Emission Reductions (MT CO <sub>2</sub> e/yr) |
|---|---|---|-------------------|---|--|---|
| <b>Med- and Heavy-Duty Vehicle Efficiency<sup>3</sup></b> |   |   |                   |   |  |   |
| 2020  | 168.10  | 1.4   | 0.03%             | 275,326   | 273,640  | 1,686   |
| 2035 <sup>4</sup>   | 168.10  | 1.4   | 0.03%             | 335,539   | 333,443  | 2,096   |
| <b>Pavley II</b>  |   |   |                   |   |  |   |
| 2020  | 168.10  | 4.0   | 2.4%              | 275,326   | 268,376  | 6,950   |
| 2035 <sup>4</sup>   | 168.10  | 4.0   | 2.4%              | 335,539   | 327,155  | 8,384   |
| <b>Total Reductions</b>                                   |   |   |                   |   |  |   |
| 2020  | -   | -   | -                 | -   | -  | 59,230 <sup>5</sup>                           |
| 2035 <sup>4</sup>   | -   | -   | -                 | -   | -  | 92,900 <sup>5</sup>                           |

Notes: MMT CO<sub>2</sub>e/yr = million metric tons of carbon dioxide equivalent per year; MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalent per year.

<sup>1</sup> Obtained from the ARB's 2020 projected inventory.

<sup>2</sup> Obtained from ARB's updated AB 32 Scoping Plan implementation schedule.

<sup>3</sup> Combines two AB 32 Scoping Plan action items: Heavy-Duty Vehicle Aerodynamic Efficiency Program and Medium- and Heavy-Duty Vehicle Hybridization Program

<sup>4</sup> ARB has not projected California statewide emissions or emission reductions associated with the AB 32 Scoping Plan out to year 2035. It is anticipated that additional efficiency could increase the measures reductions; however, the same level of reductions was assumed for both 2020 and 2035.

<sup>5</sup> Total reductions equal the sum of emissions reductions from Pavley I and Low Carbon Fuel Standard (see Table B-19) and the transportation measures described and presented above.

Source: AECOM 2012, ARB 2010c, ARB 2011.

## 2008 and 2013 California Title-24 Standards

### *Impact of 2008 Title-24*

The first step of this analysis estimates the reduction in energy-related emissions (i.e., electricity and natural gas) associated with new buildings constructed from January 2010 through December 2013. This construction is subject to the current (2008) Title 24 energy code and therefore is more efficient than buildings constructed under the 2005 Title 24 energy code requirements. Business-as-usual electricity and natural gas consumption levels for residential and non-residential construction were established using the CEC's Residential Appliance Saturation Survey data and the Commercial End Use Survey data for Forecast Climate Zone 3. The California Energy Commission's (CEC) report entitled *Impact Analysis - 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings* provides data on the energy savings potential of construction subject to 2008 requirements compared to construction subject to the 2005 baseline requirements. This savings potential was applied to projected levels of residential and non-residential construction for the jurisdiction (see Table B-21).

| <b>Table B-21</b>                                 |                      |                         |
|---|----------------------|-------------------------|
| <b>Impact of 2008 T-24 on Building Energy Use</b> |                      |                         |
| <b>Residential - Local Climate Zone</b>           |                      |                         |
| <b>Title-24 Period</b>                            | <b>kWH/unit/year</b> | <b>therms/unit/year</b> |
| T-24 2005 Residential (SFR) Energy Use            | 7,514                | 364                     |
| T-24 2008 Residential (SFR) Energy Use            | 7,410                | 316                     |
| % difference                                      | -1.4%                | -13.1%                  |
| <b>Non-Residential - Local Climate Zone</b>       |                      |                         |
| <b>Title-24 Period</b>                            | <b>kWH/unit/year</b> | <b>kBTU/unit/year</b>   |
| T-24 2005 Residential (SFR) Energy Use            | 13.64                | 29.49                   |
| T-24 2008 Residential (SFR) Energy Use            | 13.04                | 25.45                   |
| % difference                                      | -4.4%                | -13.7%                  |

Note:

-Used RASS 'SFR' category for residential.

-Used CEUS 'All Commercial' category for non-residential.

### *Impact of 2013 Title-24*

The second step of this analysis estimates the reduction in energy-related emissions (i.e., electricity and natural gas) associated with new buildings constructed from January 2014 forward. The CAPCOA report *"Quantifying Greenhouse Gas Mitigation Measures"* provides a methodology for calculating the reduction in energy-related emissions (i.e., electricity and natural gas) resulting from new construction built to energy efficiency standards above the current (2008) Title 24 energy code. The methodology calculates the reduction in electricity and natural gas consumption for each percent increase over current Title 24 standards per residential and non-residential building type and climate zone.

Baseline electricity and natural gas consumption levels per residential unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3. Mitigated levels of electricity and natural gas consumption levels per building type were calculated using the CAPCOA methodology. The measure assumes that all new buildings constructed after January 2014 will exceed 2008 Title 24 energy standards by 25%. This assumption was based on the following CEC press release.

[http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013\\_Building\\_Energy\\_Efficiency\\_Standards\\_FAQ.pdf](http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013_Building_Energy_Efficiency_Standards_FAQ.pdf)

### ***Building Construction Projections***

Projections of new residential development were developed from SCTPA traffic model inputs. Projections for new non-residential development were developed by using existing non-residential building area data from the County Assessors database and assuming the SCTPA traffic model employment growth rate to estimate growth in non-residential building stock.

## **SB 375**

SB 375 is designed to align and coordinate a region's transportation planning efforts, GHG emission reduction targets, and land use and housing allocations. The primary tool of SB 375 are Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which are to be developed by the local metropolitan planning organization (MPO) to prescribe land use allocations in the applicable regional transportation plan (RTP). ARB, in coordination with each MPO will set GHG emissions reduction targets for regions. In order to account for the strategies that will be implemented by SB 375, the projections assumed that the SCS and APS developed by Shasta County RTPA would achieve a zero per capita vehicle miles traveled (VMT) growth. In other words, the current year 2008 baseline VMT per capita was assumed to remain constant until 2035 and VMT would only grow proportional to population growth. See Table B-22 for calculations and assumptions used to quantify reductions from SB 375.

| <b>Table B-22</b>  |             |             |
|--|-------------|-------------|
| <b>Unincorporated County VMT Growth (SB 375)</b>                                   |             |             |
| <b>Parameter</b>   | <b>2020</b> | <b>2035</b> |
| Total Transportation Emissions (BAU)<br>(MT CO <sub>2</sub> e/yr)                  | 275,326     | 335,539     |
| Population Growth from Baseline 2008   | 4.3%        | 19.2%       |
| Total Transportation Emissions (With SB 375)<br>(MT CO <sub>2</sub> e/yr)          | 254,118     | 290,474     |
| Emission Reductions<br>(MT CO <sub>2</sub> e/yr)                                   | 21,208      | 45,065      |
| Notes: MT CO <sub>2</sub> e/yr = metric tons of carbon dioxide equivalent per year |             |             |
| Source: AECOM 2012   |             |             |

# CITY OF ANDERSON



## GREENHOUSE GAS REDUCTION MEASURE QUANTIFICATION METHODOLOGY

This appendix summarizes the methodology for quantifying greenhouse gas (GHG) reductions resulting from implementing the Climate Action Plan (CAP) measures. Calculations and/or background information are only shown for horizon year 2020. Energy emissions factors based on an RPS-compliant energy source mix were used to quantify emissions reductions for all measures resulting in electricity savings to avoid double counting.



### Measure B-1: Energy Efficiency Retrofits

This measure estimates the reduction in energy-related emissions (i.e., electricity and natural gas) resulting from retrofitting existing residential units and commercial properties. The measure includes retrofitting both single- and multi-family units based on a pre-defined package of energy efficiency retrofits that include installation of programmable thermostats, gas water heater upgrades, installation of high-efficiency light bulbs, gas furnace upgrades, duct sealing, foundation insulation, and building envelope sealing/weatherization.

Baseline electricity and natural gas consumption levels per unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3, which covers 85 to 95 percent of Shasta County. Mitigated energy savings estimates were based on outputs from Lawrence Berkeley Laboratory's Home Energy Saver™ building energy modeling software. The model-derived energy savings estimates were downscaled in order to be conservative in emissions reduction calculations. Total energy savings were calculated by subtracting the mitigated electricity and natural gas consumption levels from baseline levels. See Table B-1 and B-2 for data used to calculate emissions reductions.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | 10% of existing residential units and 10% of existing non-residential square feet perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, AC refrigerant recharge) | 127 MT CO <sub>2</sub> e/yr             | <i>Building Data: Shasta County Assessor's Office parcel data</i><br><i>Baseline Energy Consumption: Commercial End Use Survey, CEC, 2006</i><br><i>Energy Savings from Retrofit Packages: AECOM SSIMe™ Building Energy Analysis</i><br><i>Baseline Energy Consumption: Residential Appliance Saturation Survey, CEC, 2010</i><br><i>Energy Savings from Retrofit Packages: SSIMe Building Energy Model, AECOM 2011</i><br><i>Participation Rates: City of Anderson, 2012</i> |

### Measure BE-2: New Construction

Reductions associated with this measure are described in Statewide Measures Reductions on page B-49.

**Table B-1**  
**Residential Retrofits**

| <b>Baseline Energy Consumption</b>  |                    |                           |                      |                         |                        |                          |
|-------------------------------------|--------------------|---------------------------|----------------------|-------------------------|------------------------|--------------------------|
|                                     | <b>Total Units</b> | <b>Participation Rate</b> | <b>kWh/unit/year</b> | <b>therms/unit/year</b> | <b>Total kWhr/year</b> | <b>Total therms/year</b> |
| Single Family                       | 2,544              | 10%                       | 8,836                | 562                     | 2,247,878              | 142,881                  |
| Townhome                            | 201                | 10%                       | 5,762                | 327                     | 115,816                | 6,570                    |
| 2-4 unit apartment                  | 360                | 10%                       | 4,595                | 305                     | 165,420                | 10,998                   |
| 5+ unit apartment                   | 687                | 10%                       | 5,248                | 199                     | 360,538                | 13,656                   |
| Mobile Home                         | 169                | 0%                        | na                   | na                      | na                     | na                       |
| <b>Total</b>                        | <b>3,961</b>       |                           |                      |                         | <b>2,889,652</b>       | <b>174,104</b>           |
| <b>Mitigated Energy Consumption</b> |                    |                           |                      |                         |                        |                          |
|                                     | <b>Total Units</b> | <b>Participation Rate</b> | <b>kWh/unit/year</b> | <b>therms/unit/year</b> | <b>Total kWhr/year</b> | <b>Total therms/year</b> |
| Single Family                       | 2,544              | 10%                       | 8,836                | 489                     | 2,247,878              | 124,505                  |
| Townhome                            | 201                | 10%                       | 5,722                | 305                     | 115,004                | 6,140                    |
| 2-4 unit apartment                  | 360                | 10%                       | 4,566                | 272                     | 164,385                | 9,801                    |
| 5+ unit apartment                   | 687                | 10%                       | 5,217                | 189                     | 358,393                | 12,964                   |
| Mobile Home                         | 169                | 0%                        | na                   | na                      | na                     | na                       |
| <b>Total</b>                        | <b>3,961</b>       |                           |                      |                         | <b>2,885,660</b>       | <b>153,410</b>           |
| <b>Energy Savings</b>               |                    |                           |                      |                         | <b>3,992</b>           | <b>20,694</b>            |

**Table B-2**  
**Commercial Retrofits**

| <b>Baseline Energy Consumption</b>               |                   |                           |                      |                       |                        |                        |
|--|-------------------|---------------------------|----------------------|-----------------------|------------------------|------------------------|
|  | <b>Total SQFT</b> | <b>Participation Rate</b> | <b>kWh/sqft/year</b> | <b>kBTU/sqft/year</b> | <b>Total kWhr/year</b> | <b>Total kBTU/year</b> |
| All Warehouse                                    | 147,446           | 10%                       | 22.7                 | 0.0                   | 334,201                | 0                      |
| Health   | 8,031             | 10%                       | 15.0                 | 46.6                  | 12,078                 | 37,425                 |
| Lodging  | 18,970            | 10%                       | 10.1                 | 27.2                  | 19,111                 | 51,526                 |
| Restaurant                                       | 16,668            | 10%                       | 33.2                 | 214.0                 | 55,414                 | 356,766                |
| Retail   | 675,143           | 10%                       | 10.1                 | 12.8                  | 678,947                | 863,384                |
| Small Office                                     | 1,058             | 10%                       | 9.4                  | 9.9                   | 995                    | 1,048                  |
| <b>Total</b>                                     | <b>867,316</b>    | -                         | -                    | -                     | <b>1,100,746</b>       | <b>1,310,148</b>       |
| <b>Mitigated Energy Consumption</b>              |                   |                           |                      |                       |                        |                        |
|  | <b>Total SQFT</b> | <b>Participation Rate</b> | <b>kWh/sqft/year</b> | <b>kBTU/sqft/year</b> | <b>Total kWhr/year</b> | <b>Total kBTU/year</b> |
| All Warehouse                                    | 147,446           | 10%                       | 22.6                 | 0.0                   | 333,039                | 0                      |
| Health   | 8,031             | 10%                       | 13.9                 | 46.6                  | 11,179                 | 37,425                 |
| Lodging  | 18,970            | 10%                       | 8.9                  | 27.2                  | 16,792                 | 51,526                 |
| Restaurant                                       | 16,668            | 10%                       | 32.2                 | 214.0                 | 53,640                 | 356,766                |
| Retail   | 675,143           | 10%                       | 9.3                  | 12.8                  | 629,968                | 863,384                |
| Small Office                                     | 1,058             | 10%                       | 8.9                  | 9.9                   | 946                    | 1,048                  |
| <b>Total</b>                                     | <b>867,316</b>    | -                         | -                    | -                     | <b>1,044,619</b>       | <b>1,309,100</b>       |
| <b>Energy Savings (Baseline minus Mitigated)</b> |                   |                           |                      |                       | <b>56,127</b>          | <b>1,048</b>           |

### Measure B-3: Commercial Lighting

This measure estimates the reduction in electricity-related emissions resulting from indoor and outdoor light retrofits within commercial land uses. Baseline lighting electricity loads per square foot per non-residential use type were identified using CEC's Commercial End Use Survey data for Forecast Climate Zone 3 (see Table B-3).

The measure assumes that indoor lighting retrofits would occur at a performance level identified within the State's *Database for Energy Efficient Resources*. For 2020, the City assumes that 40% of total community-wide nonresidential square footage would implement a 40% indoor lighting load reduction. It was also assumed that 40% of total community-wide nonresidential square footage would implement a 40% exterior lighting load reduction. All non-residential uses (office, retail, and warehouse) are included in these calculations. Participation rates also reflect the assumption that State and federal light bulb efficiency standards (i.e. Energy Independence and Security Act of 2007) will assist in the implementation of this measure.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|------|--|---|--|
| 2020 | 40% of businesses improve interior lighting efficiency by 40%. | 183 MT CO <sub>2</sub> e/yr             | <i>Baseline Energy Consumption: Commercial End Use Survey, CEC, 2006</i>   |
|      | 40% of businesses improve exterior lighting efficiency by 40%. |   | <i>Energy Savings from Retrofit Packages: CEC/CPCU Database for Energy Efficient Resources, 2005</i><br><br><i>Participation Rates: City of Anderson, 2011</i> |

**Table B-3**  
**Indoor and Exterior Lighting Energy**

| Commercial Use Type | Baseline (kWh/SF/Year) | Mitigated (kWh/SF/Year) |
|---------------------|------------------------|-------------------------|
| Grocery             | 36.27                  | 33.31                   |
| Health              | 15.04                  | 13.54                   |
| Lodging             | 10.07                  | 9.44                    |
| Large Office        | 14.20                  | 12.62                   |
| Restaurant          | 33.25                  | 30.81                   |
| Retail              | 10.06                  | 8.43                    |
| School              | 8.82                   | 7.63                    |
| Small Office        | 9.40                   | 8.26                    |
| Warehouse (All)     | 22.67                  | 21.55                   |

Source: CEC 2006

### Measure B-4: Efficient Appliances

This measure estimates the reduction in electricity-related emissions resulting from installing energy-efficient appliances in new and existing residential units. This measure focuses on installation of energy-efficient refrigerators, clothes washers, and dishwashers. The CAPCOA report “*Quantifying Greenhouse Gas Mitigation Measures*” provides a methodology for calculating the electricity reductions associated with the installation of energy-efficient refrigerators, clothes washers, and dishwashers. The City selected participation rates on the assumption that State and utility outreach programs will increase the market share of ENERGY STAR appliances above current levels. Baseline market share values from a *Northwestern Energy Alliance* study indicate that approximately 33% of consumers purchase ENERGY STAR refrigerators, 83% purchase ENERGY STAR dishwashers, and 36% purchase ENERGY STAR clothes washers. The study shows a strong trend of increasing ENERGY STAR appliance market share over the past decade. For 2020, the City assumes that additional outreach and rebates will further increase the ENERGY STAR appliance market share in Anderson. For new residential units, the measure assumes use of energy-efficient refrigerators, dishwashers, and clothes washers will increase to a market share of 70%. The City assumes that 40% of existing residential units will install energy-efficient refrigerators and dishwashers, and 80% of existing residential units will install energy-efficient clothes washers.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | 40% of existing homes will replace old model refrigerators and dishwashers               | 229 MT CO <sub>2</sub> e/yr             | <p><i>Quantification Methodology: Energy Efficient Appliance Reduction: CAPCOA. 2010 (August). Quantifying Greenhouse Gas Mitigation Measures. Available: &lt;<a href="http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf">http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf</a>&gt;.</i></p> <p><i>Participation Rates: ENERGY STAR Consumer Products Program: Market Progress Evaluation Report. Prepared by KEMA, Inc. July 24, 2007. Prepared for Northwestern Energy Efficiency Alliance.</i></p> |
|      | 80% of existing homes will replace old clothes washers with new Energy Star models       |   |   |
|      | 70% of new homes will install Energy Star refrigerators, dishwashers and clothes washers |   |   |

### Measure B-5: Smart Grid Integration

This measure estimates the reduction in electricity-related emissions resulting from integration of Smart Grid technologies in new and existing residential and commercial land uses. Literature indicates that integration of Smart Grid technologies reduces electricity use by more than 5% in existing residential and commercial buildings and 6% in new residential and commercial buildings. For 2020, the measure assumes that 50% of all new residential buildings and 20% of existing residential and commercial buildings will integrate Smart Grid technologies.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | 20% of existing residential units to use Smart Grid technology | 711 MT CO <sub>2</sub> e/yr             | <i>Smart Grid Reduction: SMART 2020: Enabling the low carbon economy in the information age, The Climate Group on behalf of the Global Sustainability Initiative (GeSI)</i>   |
|      | 50% of new residential units to use Smart Grid technology      |   | <i>Estimating the Benefits of the GridWise Initiative Phase I Report Walter S. Baer, Brent Fulton, Sergej Mahnovski TR-160-PNNL, May 2004 Prepared for the Pacific Northwest National Laboratory</i><br><br><i>Participation Rates: Pacific Northwest National Laboratory, Estimating the Benefits of the GridWise Initiative Phase I Report Walter S. Baer, Brent Fulton, Sergej Mahnovski TR-160-PNNL, May 2004</i> |

### Measure B-6: Solar Water Heaters

This measure quantifies natural gas and electricity-related emissions reductions resulting from the installation of solar hot water heaters in residential units and commercial buildings. Baseline water heating-related natural gas consumption levels per residential unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3. In addition, CEC data identifies the energy savings potential of solar hot water heaters for specific climates in California. The measure assumes that 40-67% of water-heating natural gas can be reduced through the use of solar hot water heaters. The measure assumes that 2% of all residential units (i.e., single family and multi-family) and 2% of all commercial buildings will install solar hot water heaters to meet their hot water demands. Care should be taken to avoid double-counting between a solar hot water heater installed to help new residential units achieve the building code-mandated energy efficiency performance and solar hot water heaters installed in excess of that requirement. Table B-4 provides the assumptions used to quantify reductions from solar water heaters.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | 2% of residences and commercial buildings installed a solar hot water system. | 56 MT CO <sub>2</sub> e/yr              | <i>Baseline Hot Water Natural Gas Consumption: Residential Appliance Saturation Survey, CEC, 2010</i><br><br><i>Solar Fraction: Solar Water Heating CEC 2013 Title 24 Pre-rulemaking Workshop, California Energy Commission, June 9, 2011</i> |

**Table B-4**  
**Solar Water Heaters – 2020**

| <b>Residential Units</b>    |                 |  |  |  |                                       |                                |
|-----------------------------|-----------------|--|--|--|---------------------------------------|--------------------------------|
|                             | Units<br>(2020) | Hot Water<br>Heater<br>Energy per<br>Unit<br>(therms/year) | Solar Water<br>Heater<br>Effectiveness | Energy<br>Savings per<br>Unit<br>(therms/year) | Participation<br>Rate<br>(% of units) | Total Savings<br>(therms/year) |
| Single Family               | 3,042           | 196  | 67%                                    | 131.54   | 2%                                    | 8,001                          |
| Townhouse                   | 240             | 170  | 67%                                    | 114.15   | 2%                                    | 549                            |
| 2-4 unit<br>apartment       | 430             | 135  | 59%                                    | 79.65  | 2%                                    | 686                            |
| 5+ unit<br>apartment        | 821             | 84   | 59%                                    | 49.30  | 2%                                    | 810                            |
| <b>Total</b>                | <b>4,534</b>    |  |  |  |                                       | <b>10,046</b>                  |
| <b>Commercial Buildings</b> |                 |  |  |  |                                       |                                |
|                             | SQFT<br>(2020)  | Hot Water<br>Heater Energy<br>per SQFT<br>(kBTU/year)      | Solar Water<br>Heater<br>Effectiveness | Energy Savings<br>per SQFT<br>(kBTU/year)      | Participation<br>Rate<br>(% of sqft)  | Total Savings<br>(kBTU/year)   |
| All Warehouse               | 168,313         | 0.00   | 50%                                    | 0.00   | 2%                                    | 0                              |
| Health                      | 9,168           | 17.34  | 50%                                    | 8.67   | 2%                                    | 1,589                          |
| Lodging                     | 21,655          | 14.27  | 50%                                    | 7.14   | 2%                                    | 3,090                          |
| Restaurant                  | 19,027          | 29.95  | 50%                                    | 14.97  | 2%                                    | 5,698                          |
| Retail                      | 770,690         | 1.91   | 50%                                    | 0.96   | 2%                                    | 14,757                         |
| Small Office                | 1,208           | 1.23   | 50%                                    | 0.62   | 2%                                    | 15                             |
| <b>Total</b>                | <b>992,079</b>  |  |  |  |                                       | <b>25,149</b>                  |

### Measure SW-1: Enhanced Organic Waste Diversion

An inventory of the community's organic waste was created using Cal Recycle waste volume and characterization data. Using the first-order decay methodology from the 2006 IPCC guidelines, fugitive methane emissions from the organic landfill waste were calculated for base-case and mitigated scenarios. This measure assumes that residential and commercial uses will divert 50% of yard waste (highlighted in green in Tables B-5 and B-6) and construction/demolition waste (highlighted in blue in Tables B-5 and B-6) from landfills by 2020. This measure would apply to GHG emissions associated with new waste generated and would not apply to waste in place disposed prior to CAP implementation.

Calculations for this measure factored in the advanced methane recovery rate described in Measure SW-2 to avoid double counting emissions reductions.

| Year        | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|-------------|--|---|---|
| <b>2020</b> | Community increases diversion of yard and construction and demolition wastes by 50%. | 159 MT CO <sub>2</sub> e/yr             | <i>CalRecycle Waste Characterization Data, 2011</i><br><i>IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5 Chapter 3.</i> |



**Table B-5**  
**Baseline Degradable Organic Carbon Disposed**

**Commercial Waste – Baseline Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/<br>Demolition | Sludge/<br>Manure | Total |
|------|-----------|--------------|------------------|--------------|------|-------|--------|----------|--------|----------|---------|-----------------------------|-------------------|-------|
| 2008 | 4.4       | 34.3         | 63.9             | 35.1         | 82.1 | 3.5   | 13.5   | 13.0     | 96.5   | 32.4     | 17.1    | 7.2                         | 0.0               | 402.9 |
| 2009 | 4.4       | 34.5         | 64.3             | 35.3         | 82.6 | 3.5   | 13.6   | 13.1     | 97.1   | 32.6     | 17.2    | 7.2                         | 0.0               | 405.2 |
| 2010 | 4.5       | 34.7         | 64.6             | 35.5         | 83.1 | 3.5   | 13.6   | 13.2     | 97.7   | 32.8     | 17.3    | 7.3                         | 0.0               | 407.5 |
| 2011 | 4.5       | 34.9         | 65.0             | 35.7         | 83.5 | 3.5   | 13.7   | 13.2     | 98.2   | 33.0     | 17.4    | 7.3                         | 0.0               | 409.9 |
| 2012 | 4.5       | 35.1         | 65.4             | 35.9         | 84.0 | 3.5   | 13.8   | 13.3     | 98.8   | 33.1     | 17.5    | 7.3                         | 0.0               | 412.2 |
| 2013 | 4.5       | 35.3         | 65.7             | 36.1         | 84.5 | 3.6   | 13.9   | 13.4     | 99.3   | 33.3     | 17.5    | 7.4                         | 0.0               | 414.5 |
| 2014 | 4.6       | 35.5         | 66.1             | 36.3         | 85.0 | 3.6   | 14.0   | 13.5     | 99.9   | 33.5     | 17.6    | 7.4                         | 0.0               | 416.9 |
| 2015 | 4.6       | 35.7         | 66.5             | 36.5         | 85.5 | 3.6   | 14.0   | 13.5     | 100.5  | 33.7     | 17.8    | 7.5                         | 0.0               | 419.3 |
| 2016 | 4.6       | 35.9         | 66.9             | 36.7         | 85.9 | 3.6   | 14.1   | 13.6     | 101.0  | 33.9     | 17.9    | 7.5                         | 0.0               | 421.7 |
| 2017 | 4.6       | 36.1         | 67.2             | 36.9         | 86.4 | 3.6   | 14.2   | 13.7     | 101.6  | 34.1     | 18.0    | 7.6                         | 0.0               | 424.1 |
| 2018 | 4.7       | 36.3         | 67.6             | 37.1         | 86.9 | 3.7   | 14.3   | 13.8     | 102.2  | 34.3     | 18.1    | 7.6                         | 0.0               | 426.5 |
| 2019 | 4.7       | 36.5         | 68.0             | 37.3         | 87.4 | 3.7   | 14.4   | 13.8     | 102.8  | 34.5     | 18.2    | 7.6                         | 0.0               | 428.9 |
| 2020 | 4.7       | 36.7         | 68.4             | 37.5         | 87.9 | 3.7   | 14.4   | 13.9     | 103.4  | 34.7     | 18.3    | 7.7                         | 0.0               | 431.3 |

**Residential Waste – Baseline Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/<br>Demolition | Sludge/<br>Manure | Total |
|------|-----------|--------------|------------------|--------------|------|-------|--------|----------|--------|----------|---------|-----------------------------|-------------------|-------|
| 2008 | 6.0       | 21.5         | 17.3             | 27.4         | 92.4 | 3.6   | 8.6    | 3.6      | 26.7   | 25.3     | 29.5    | 2.2                         | 0.1               | 264.2 |
| 2009 | 6.0       | 21.6         | 17.4             | 27.5         | 92.9 | 3.6   | 8.7    | 3.6      | 26.9   | 25.4     | 29.7    | 2.2                         | 0.1               | 265.7 |
| 2010 | 6.1       | 21.7         | 17.5             | 27.7         | 93.5 | 3.6   | 8.7    | 3.7      | 27.0   | 25.6     | 29.9    | 2.2                         | 0.1               | 267.2 |
| 2011 | 6.1       | 21.9         | 17.6             | 27.8         | 94.0 | 3.6   | 8.8    | 3.7      | 27.2   | 25.7     | 30.1    | 2.2                         | 0.1               | 268.7 |
| 2012 | 6.1       | 22.0         | 17.7             | 28.0         | 94.5 | 3.6   | 8.8    | 3.7      | 27.3   | 25.8     | 30.2    | 2.2                         | 0.1               | 270.2 |
| 2013 | 6.2       | 22.1         | 17.8             | 28.2         | 95.1 | 3.7   | 8.9    | 3.7      | 27.5   | 26.0     | 30.4    | 2.2                         | 0.1               | 271.8 |
| 2014 | 6.2       | 22.2         | 17.9             | 28.3         | 95.6 | 3.7   | 8.9    | 3.8      | 27.6   | 26.1     | 30.6    | 2.2                         | 0.1               | 273.3 |
| 2015 | 6.2       | 22.4         | 18.0             | 28.5         | 96.1 | 3.7   | 9.0    | 3.8      | 27.8   | 26.3     | 30.7    | 2.3                         | 0.1               | 274.9 |
| 2016 | 6.3       | 22.5         | 18.1             | 28.6         | 96.7 | 3.7   | 9.0    | 3.8      | 28.0   | 26.4     | 30.9    | 2.3                         | 0.1               | 276.4 |
| 2017 | 6.3       | 22.6         | 18.2             | 28.8         | 97.2 | 3.7   | 9.1    | 3.8      | 28.1   | 26.6     | 31.1    | 2.3                         | 0.1               | 278.0 |
| 2018 | 6.3       | 22.7         | 18.3             | 29.0         | 97.8 | 3.8   | 9.1    | 3.8      | 28.3   | 26.7     | 31.3    | 2.3                         | 0.1               | 279.6 |
| 2019 | 6.4       | 22.9         | 18.4             | 29.1         | 98.4 | 3.8   | 9.2    | 3.9      | 28.4   | 26.9     | 31.4    | 2.3                         | 0.1               | 281.2 |
| 2020 | 6.4       | 23.0         | 18.5             | 29.3         | 98.9 | 3.8   | 9.2    | 3.9      | 28.6   | 27.0     | 31.6    | 2.3                         | 0.1               | 282.8 |

**Table B-6**  
**Mitigated Degradable Organic Carbon Disposed**

**Commercial Waste – Mitigated Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/ Demolition | Sludge/ Manure | Total |
|------|-----------|--------------|------------------|--------------|------|-------|--------|----------|--------|----------|---------|--------------------------|----------------|-------|
| 2008 | 4.4       | 34.3         | 63.9             | 35.1         | 82.1 | 3.5   | 13.5   | 13.0     | 48.3   | 32.4     | 17.1    | 7.2                      | 0.0            | 354.7 |
| 2009 | 4.4       | 34.5         | 64.3             | 35.3         | 82.6 | 3.5   | 13.6   | 13.1     | 48.5   | 32.6     | 17.2    | 7.2                      | 0.0            | 356.7 |
| 2010 | 4.5       | 34.7         | 64.6             | 35.5         | 83.1 | 3.5   | 13.6   | 13.2     | 48.8   | 32.8     | 17.3    | 7.3                      | 0.0            | 358.7 |
| 2011 | 4.5       | 34.9         | 65.0             | 35.7         | 83.5 | 3.5   | 13.7   | 13.2     | 49.1   | 33.0     | 17.4    | 7.3                      | 0.0            | 360.8 |
| 2012 | 4.5       | 35.1         | 65.4             | 35.9         | 84.0 | 3.5   | 13.8   | 13.3     | 49.4   | 33.1     | 17.5    | 7.3                      | 0.0            | 362.8 |
| 2013 | 4.5       | 35.3         | 65.7             | 36.1         | 84.5 | 3.6   | 13.9   | 13.4     | 49.7   | 33.3     | 17.5    | 7.4                      | 0.0            | 364.9 |
| 2014 | 4.6       | 35.5         | 66.1             | 36.3         | 85.0 | 3.6   | 14.0   | 13.5     | 49.9   | 33.5     | 17.6    | 7.4                      | 0.0            | 367.0 |
| 2015 | 4.6       | 35.7         | 66.5             | 36.5         | 85.5 | 3.6   | 14.0   | 13.5     | 50.2   | 33.7     | 17.8    | 7.5                      | 0.0            | 369.0 |
| 2016 | 4.6       | 35.9         | 66.9             | 36.7         | 85.9 | 3.6   | 14.1   | 13.6     | 50.5   | 33.9     | 17.9    | 7.5                      | 0.0            | 371.1 |
| 2017 | 4.6       | 36.1         | 67.2             | 36.9         | 86.4 | 3.6   | 14.2   | 13.7     | 50.8   | 34.1     | 18.0    | 7.6                      | 0.0            | 373.3 |
| 2018 | 4.7       | 36.3         | 67.6             | 37.1         | 86.9 | 3.7   | 14.3   | 13.8     | 51.1   | 34.3     | 18.1    | 7.6                      | 0.0            | 375.4 |
| 2019 | 4.7       | 36.5         | 68.0             | 37.3         | 87.4 | 3.7   | 14.4   | 13.8     | 51.4   | 34.5     | 18.2    | 7.6                      | 0.0            | 377.5 |
| 2020 | 4.7       | 36.7         | 68.4             | 37.5         | 87.9 | 3.7   | 14.4   | 13.9     | 51.7   | 34.7     | 18.3    | 7.7                      | 0.0            | 379.7 |

**Residential Waste – Mitigated Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/ Demolition | Sludge/ Manure | Total |
|------|-----------|--------------|------------------|--------------|------|-------|--------|----------|--------|----------|---------|--------------------------|----------------|-------|
| 2008 | 6.0       | 21.5         | 17.3             | 27.4         | 92.4 | 3.6   | 8.6    | 3.6      | 13.4   | 25.3     | 29.5    | 2.2                      | 0.1            | 250.8 |
| 2009 | 6.0       | 21.6         | 17.4             | 27.5         | 92.9 | 3.6   | 8.7    | 3.6      | 13.4   | 25.4     | 29.7    | 2.2                      | 0.1            | 252.2 |
| 2010 | 6.1       | 21.7         | 17.5             | 27.7         | 93.5 | 3.6   | 8.7    | 3.7      | 13.5   | 25.6     | 29.9    | 2.2                      | 0.1            | 253.7 |
| 2011 | 6.1       | 21.9         | 17.6             | 27.8         | 94.0 | 3.6   | 8.8    | 3.7      | 13.6   | 25.7     | 30.1    | 2.2                      | 0.1            | 255.1 |
| 2012 | 6.1       | 22.0         | 17.7             | 28.0         | 94.5 | 3.6   | 8.8    | 3.7      | 13.7   | 25.8     | 30.2    | 2.2                      | 0.1            | 256.6 |
| 2013 | 6.2       | 22.1         | 17.8             | 28.2         | 95.1 | 3.7   | 8.9    | 3.7      | 13.7   | 26.0     | 30.4    | 2.2                      | 0.1            | 258.0 |
| 2014 | 6.2       | 22.2         | 17.9             | 28.3         | 95.6 | 3.7   | 8.9    | 3.8      | 13.8   | 26.1     | 30.6    | 2.2                      | 0.1            | 259.5 |
| 2015 | 6.2       | 22.4         | 18.0             | 28.5         | 96.1 | 3.7   | 9.0    | 3.8      | 13.9   | 26.3     | 30.7    | 2.3                      | 0.1            | 261.0 |
| 2016 | 6.3       | 22.5         | 18.1             | 28.6         | 96.7 | 3.7   | 9.0    | 3.8      | 14.0   | 26.4     | 30.9    | 2.3                      | 0.1            | 262.5 |
| 2017 | 6.3       | 22.6         | 18.2             | 28.8         | 97.2 | 3.7   | 9.1    | 3.8      | 14.1   | 26.6     | 31.1    | 2.3                      | 0.1            | 263.9 |
| 2018 | 6.3       | 22.7         | 18.3             | 29.0         | 97.8 | 3.8   | 9.1    | 3.8      | 14.1   | 26.7     | 31.3    | 2.3                      | 0.1            | 265.4 |
| 2019 | 6.4       | 22.9         | 18.4             | 29.1         | 98.4 | 3.8   | 9.2    | 3.9      | 14.2   | 26.9     | 31.4    | 2.3                      | 0.1            | 267.0 |
| 2020 | 6.4       | 23.0         | 18.5             | 29.3         | 98.9 | 3.8   | 9.2    | 3.9      | 14.3   | 27.0     | 31.6    | 2.3                      | 0.1            | 268.5 |

### Measure SW-2: Methane Recovery

This measure estimates the reductions resulting from installation of a landfill gas recovery system at the West Central Landfill in order to comply with an adopted ARB regulation described as a discrete early action GHG emissions reduction measure in the AB 32 *Climate Change Scoping Plan*. Two landfills currently accept municipal solid waste (MSW) in Shasta County. The Anderson Landfill already has a landfill gas recovery system in place, and no efficiency upgrades are anticipated at this time. Table B-7 shows the percentage of total waste sent to each landfill that is attributed to Anderson. It also shows the baseline and mitigated methane capture rate scenarios upon which emissions reductions were calculated.

This measure would apply to GHG emissions associated with new waste generated and waste-in-place disposed prior to GGRP implementation.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | West Central Landfill achieves a methane control efficiency of 75%. | 3,319 MT CO <sub>2</sub> e/yr           | <i>CalRecycle Waste Characterization Data, 2011</i><br><i>IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5 Chapter 3.</i> |

| Table B-7<br>Waste Contributions per Landfill and Methane Capture Rates |   |                                      |  |
|---|---|--------------------------------------|--|
| Landfill  | Proportion of Total Refuse Received at Landfill from City of Anderson | BAU Scenario – Methane Capture Rates | Mitigated Scenario – Methane Capture Rates |
| West Central Landfill   | 5.00%   | 0%                                   | 75%  |
| Anderson Landfill   | 2.00%   | 80%                                  | 80%  |
| Benton Landfill   | 0.00%   | 90%                                  | 90%  |

Source: Ascent Environmental, 2012

### Measure T-1: Mixed Use Development

Research demonstrates that households located in areas of mixed use development including commercial retail, employment, and schools generate lower amounts of vehicle miles traveled than households located in single use residential areas. The City of Anderson estimates that 70% of all new residential units will be developed in mixed-use development areas within the City. It is estimated that the households located in these mixed use development areas will generate 5% less VMT than business-as-usual development in the City. See Table B-8 for calculations and assumptions used to quantify VMT reductions.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|------|--|---|--|
| 2020 | 70% of all new residential units constructed in mixed-use development. | 821 MT CO <sub>2</sub> e/yr             | <i>Housing Unit Assumptions: Shasta County Forecast Assumptions, Dowling Associates, 2011</i><br><i>Percent Mixed Use: City of Shasta Lake, 2011</i><br><i>VMT Reduction Estimate: Travel and the Built Environment, Ewing and Cervero, 2001</i> |

**Table B-8**  
**Mixed Use Development VMT Reductions**

|   | Community Vehicle Miles Traveled (miles) | Fuel Consumption (gallons) |
|---|--|----------------------------|
| <b>Total New Development BAU VMT - 2020</b>         |  |                            |
| Gasoline  | 25,680,339                               | 1,344,520                  |
| Diesel  | 2,695,726                                | 421,207                    |
| <b>Total</b>  | <b>28,376,065</b>                        | <b>1,765,728</b>           |
| <b>New Mixed Use Development VMT - 2020</b>         |  |                            |
| Gasoline  | 24,396,322                               | 1,277,294                  |
| Diesel  | 2,560,940                                | 400,147                    |
| <b>Total</b>  | <b>26,957,262</b>                        | <b>1,677,441</b>           |
| <b>VMT Reductions from Mixed Use Development</b>    |  |                            |
| Gasoline  | 1,284,017                                | 67,226                     |
| Diesel  | 134,786                                  | 21,060                     |
| <b>Total</b>  | <b>1,418,803</b>                         | <b>88,286</b>              |
| <b>Building Inventory and Reduction Assumptions</b> |  | <b>2020</b>                |
| Total New Units                                     |  | 775                        |
| New Mixed Used Units (70% of total)                 |  | 543                        |
| VMT Reduction Potential from Mixed Use Development  |  | 5%                         |

Note: Assumes average fuel efficiency of 19.1 miles/gallon for gasoline vehicles and 6.4 miles/gallon for diesel vehicles

### Measure T-2: Bicycle Lane Expansion

This measure quantifies reductions resulting from increasing Anderson's bicycle mode share through expansion of its bicycle infrastructure, primarily Class I and II bicycle facilities. This measure assumes the construction of 20.0 miles of new Class I and II facilities by 2020. Emissions reductions come from VMT differences between a BAU scenario and a mitigated scenario (see Table B-9). The CAPCOA methodology was used to help quantify VMT reductions based on the proposed bicycle infrastructure improvements. A mode share study conducted by Dill and Carr was used to help define assumptions regarding how additional bicycle lanes translate into increased bicycle mode share (see Table B-10). The methodology assumes that the ratio of additional bicycle lane mileage per community area correlates to increased bicycle mode share, above levels reported in the 2010 US Census.

| Year | Progress Indicators  | GHG Reduction<br>(MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|--|---|
| 2020 | 20 new miles of Class I and II bicycles lanes constructed. | 23 MT CO <sub>2</sub> e/yr                 | <p>CAPCOA. <i>Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emissions Reductions from Greenhouse Gas Mitigation Measures.</i> August, 2010.</p> <p>Dill, J and Carr, T. <i>Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them.</i> 2003.</p> |

| <b>Table B-9</b>  |                          |                            |
|---|--------------------------|----------------------------|
| <b>Communitywide VMT Reductions – Bicycle Infrastructure Improvements</b> |                          |                            |
| <b>BAU Scenario – Vehicles Miles Traveled</b>                             |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 190,022,893              | 9,948,843                  |
| Diesel  | 19,947,154               | 3,116,743                  |
| Total   | 209,970,047              | 13,065,585                 |
| <b>Mitigated Scenario – Vehicles Miles Traveled</b>                       |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 189,987,595              | 9,946,994                  |
| Diesel  | 19,943,449               | 3,116,164                  |
| Total   | 209,931,044              | 13,063,158                 |
| <b>BAU minus Mitigated Scenario</b>                                       |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 35,298                   | 1,848                      |
| Diesel  | 3,705                    | 579                        |
| <b>Total</b>  | <b>39,003</b>            | <b>2,427</b>               |

| <b>Table B-10</b>  |      |
|--|------|
| <b>Bicycle Infrastructure Assumptions</b>  |      |
| Land Area of Community (sq miles)  | 6.4  |
| <b>Existing Scenario</b>   |      |
| Bike Lanes (Class I and II)  | 10   |
| Bike Lanes/sq mile   | 1.56 |
| <b>Mitigated Scenario</b>  |      |
| Bike Lanes (Class I and II)  | 20   |
| Bike Lanes/sq mile   | 3.13 |
| % Increase in Bicycle Commute Mode Share for each Additional Mile of Bike Lane/sq mile | 1.0% |
| Mitigated Bicycle Commute Mode Share   | 1.6% |

### Measure T-3: Pedestrian Environment Enhancements

This measure quantifies reductions resulting from pedestrian enhancements based on the EPA's Smart Growth INDEX (SGI) model, and uses a variety of indicators to measure changes in the pedestrian environment, including: sidewalk availability, ease of street crossing, connectivity of street/sidewalk system, terrain, and the pedestrian environment factor. This measure assumes that 50% of intersections within the city are improved to facilitate greater pedestrian crossing and that additional sidewalks are added to improve pedestrian circulation options. Emissions reductions come from VMT differences between a BAU scenario and a mitigated scenario. The SGI model was used to help develop VMT reduction assumptions based on the proposed changes in the measure. Table B-11 shows the VMT reduction assumptions, and Table B-12 shows the VMT reduction calculations for this measure.

| Year        | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|-------------|--|---|--|
| <b>2020</b> | Improve pedestrian infrastructure and conditions in 50% of streets in the community. | 781 MT CO <sub>2</sub> e/yr             | <i>EPA Pedestrian Smart Growth INDEX model</i> |

| Table B-11<br>Application of Pedestrian Environment Factor Elasticities to VMT |            |            |
|--|------------|------------|
| Pedestrian Environment Factors (PEF)   | Baseline   | Mitigated  |
| Sidewalk Availability  | 2.0        | 3.0        |
| Ease of Street Crossing  | 2.0        | 2.5        |
| Connectivity of Street/Sidewalk System   | 2.0        | 2.0        |
| Terrain  | 1.0        | 1.0        |
| <b>PEF Score</b>   | <b>7.0</b> | <b>8.5</b> |
| Percent Change in PEF  | -          | 0.214      |
| Smart Growth INDEX PEF Elasticity  | -          | -0.03      |
| Percent Change in VMT  | -          | -0.0064    |
| Percent of Community Retrofitted   |            | 100%       |

Source: EPA Pedestrian Smart Growth INDEX model, adapted by AECOM, 2012

| Table B-12<br>Communitywide VMT Reductions – Pedestrian Environment Improvements |                          |                            |
|--|--------------------------|----------------------------|
|  | Community Travel (miles) | Fuel Consumption (gallons) |
| <b>BAU Vehicles Miles Traveled Scenario</b>                                      |                          |                            |
| Gasoline   | 190,022,893              | 9,948,843                  |
| Diesel   | 19,947,154               | 3,116,743                  |
| Total  | 209,970,047              | 13,065,585                 |
| <b>Mitigated Vehicles Miles Traveled Scenario</b>                                |                          |                            |
| Gasoline   | 188,801,317              | 9,884,886                  |
| Diesel   | 19,818,923               | 3,096,707                  |
| Total  | 208,620,240              | 12,981,592                 |
| <b>VMT and Fuel Reduction from Measure</b>                                       |                          |                            |
| Gasoline   | 610,788                  | 31,978                     |
| Diesel   | 64,116                   | 10,018                     |
| <b>Total</b>   | <b>674,904</b>           | <b>41,997</b>              |

#### Measure T-4: Commute Trip Reduction

This measure estimates the impact of transportation demand management programs in Anderson, based on the assembled research. The estimated vehicle trip reductions apply to commute trips for employees of those businesses covered by the TDM program.

**Rideshare promotion** – A study conducted by Reid Ewing concluded that ridesharing programs can reduce daily vehicle commute trips to specific worksites by 5-15%, and up to 20% or more if implemented with parking pricing. In this measure we assume 3% of commute trips shifted from SOV to other modes.

**Telecommuting/alternative work schedule** – A Center for Urban Transportation Research survey found vehicle trips reduced by up to 8% if 50% of employees are participating in alternative work programs, making it among the most effective commute trip reduction strategies considered in that study. A National Association of Regional Councils analysis estimates that compressed work weeks can reduce up to 0.6% of VMT and up to 0.5% of vehicle trips in a region. In this measure we assume telecommuting/compressed work will result in 3% of commute trips shifted from SOV to other modes.

**Subsidized transit fares** – Various studies of the impact of subsidized transit passes indicate reductions in drive-alone mode share of 4% to 42%, with an average reduction of 19%. For Anderson we estimate that a likely percent reduction in vehicle trips from transit pass subsidies would be 6% for those businesses offering passes.

Table B-13 shows calculations and assumptions used to quantify reductions from this measure.

| Year        | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|-------------|--|---|--|
| <b>2020</b> | 10% of employees in Anderson commute via carpool or public transit | 20 MT CO <sub>2</sub> e/yr              | <i>VMT reduction assumptions: AECOM, 2012.</i> |



| Table B-13<br>TDM Measure Calculations and Assumptions                             |                                |   |   |   |                         |                        |   |
|--|--------------------------------|---|---|---|-------------------------|------------------------|---|
| Percent Reduction in VMT from Implementation of TDM Measures                       |                                |   |   |   |                         |                        |   |
|  | VMT Split by Vehicle Fuel Type |   | Reduction in Total VMT by Vehicle Fuel Type |   |                         |                        |   |
|  | Gasoline                       | Diesel                                    | Gasoline                                    | Diesel                                      |                         |                        |   |
| Reduction in Total VMT   | 90.5%                          | 9.5%                                      | 0.03%                                       | 0.003%                                      |                         |                        |   |
| 2020 Mitigated Scenario – Vehicle Miles Traveled and Emissions                     |                                |   |   |   |                         |                        |   |
|  | Community Travel (miles)       | Weighted Average Fuel Efficiency (mi/gal) | Fuel Consumption (gallons)                  | Emission Factors                            |                         |                        | Total Emissions (MT CO <sub>2</sub> e/Year) |
|  |                                |   |   | CO <sub>2</sub> (g/gal)                     | N <sub>2</sub> O (g/mi) | CH <sub>4</sub> (g/mi) |   |
| Gasoline VMT (miles)   | 85,510,406                     | 19.1                                      | 4,476,985                                   | 8,599                                       | 0.0700                  | 0.0620                 | 40,391                                      |
| Diesel VMT (miles)   | 8,976,231                      | 6.4                                       | 1,402,536                                   | 10,092                                      | 0.0500                  | 0.0420                 | 14,296                                      |
| Total  | 94,486,637                     |   | 5,879,521                                   |   |                         |                        | 54,686                                      |
| Calculation of VMT, Fuel Consumption, and GHG Emission Reduction from TDM Measures |                                |   |   |   |                         |                        |   |
|  | Community Travel (miles)       | Fuel Consumption (gallons)                |   | Total Emissions (MT CO <sub>2</sub> e/Year) |                         |                        |   |
| Gasoline VMT (miles)   | 30,807.6                       | 1,613                                     |   | 14.6  |                         |                        |   |
| Diesel VMT (miles)   | 3,233.9                        | 505                                       |   | 5.2   |                         |                        |   |
| Total  | 34,042                         | 2,118                                     |   | 19.7  |                         |                        |   |

### Measure GI-1: Urban Forest

This measure is based on extrapolating the carbon potential of a typical tree planting palette. The City's goal is that 512 new trees will be planted by public and private development by 2020. Carbon sequestration rates specific to the species and age of the planted trees were collected from the Center for Urban Forest Research (CUFR) Tree Carbon Calculator and used to calculate the annual sequestration potential of the trees from 2008 – 2020. For purposes of the calculation it was assumed that an equal number of trees will be planted each year between 2008 and 2020. See Tables B-14 and B-15 for carbon sequestration assumptions used in this measure.

| Year        | Progress Indicators             | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|-------------|---------------------------------|---|---|
| <b>2020</b> | 512 new shade trees are planted | 50 MT CO <sub>2</sub> e/yr              | The Center for Urban Forest Research (CUFR) Tree Carbon Calculator. |

**Table B-14**  
**Carbon Sequestration of Trees Planted 2012-2020 in 2020**

| Year                            | Trees Planted per Year | Years of Growth | GHG Emissions Reductions (lbs CO <sub>2</sub> e in 2020) | Carbon Sequestration (MT CO <sub>2</sub> e in 2020) |
|---------------------------------|------------------------|-----------------|--|---|
| 2012                            | 64                     | 0               | 25,759   | 11.7  |
| 2013                            | 64                     | 1               | 21,566   | 9.8   |
| 2014                            | 64                     | 2               | 17,664   | 8.0   |
| 2015                            | 64                     | 3               | 14,028   | 6.4   |
| 2016                            | 64                     | 4               | 10,632   | 4.8   |
| 2017                            | 64                     | 5               | 7,458  | 3.4   |
| 2018                            | 64                     | 6               | 4,486  | 2.0   |
| 2019                            | 64                     | 7               | 2,036  | 0.9   |
| <b>Cumulative Total in 2020</b> | <b>512</b>             | NA              | 103,629  | 47.0  |

Note: Assumes age of tree at planting = 4 years

**Table B-15**  
**Carbon Sequestration per Species per Year of growth**

| Species | Camphor Tree<br><i>Cinnamomum camphora</i> | Modesto Ash<br><i>Fraxinus vutina</i> | Sweetgum<br><i>Liquidambar styraciflua</i> | Roble Negro<br><i>Quercus ilex</i> | Turkish Pine<br><i>Pinus brutia</i> | AVERAGE           |
|---------|--|---------------------------------------|--|------------------------------------|-------------------------------------|-------------------|
| Age     | per year<br>Total<br>20%                   | per year<br>Total<br>20%              | per year<br>Total<br>20%                   | per year<br>Total<br>20%           | per year<br>Total<br>20%            | per year<br>Total |
| 1       | 0.6 0.6                                    | 1.5 1.5                               | 0.2 0.2                                    | 0.0 0.0                            | 0.6 0.6                             | 0.3 0.6           |
| 2       | 0.6 1.2                                    | 13.7 15.2                             | 0.2 0.4                                    | 0.5 0.5                            | 0.6 1.2                             | 1.4 3.7           |
| 3       | 2.6 3.8                                    | 30.0 45.2                             | 0.2 0.6                                    | 3.1 3.6                            | 4.9 6.1                             | 3.7 11.9          |
| 4       | 6.0 9.8                                    | 43.7 88.9                             | 0.7 1.3                                    | 8.0 11.6                           | 12.3 18.4                           | 6.4 26.0          |
| 5       | 10.3 20.1                                  | 54.3 143.2                            | 1.7 3.0                                    | 14.3 25.9                          | 21.5 39.9                           | 9.3 46.4          |
| 6       | 13.1 33.2                                  | 58.6 201.8                            | 2.5 5.5                                    | 18.3 44.2                          | 27.5 67.4                           | 10.9 70.4         |
| 7       | 16.6 49.8                                  | 63.2 265.0                            | 3.7 9.2                                    | 23.5 67.7                          | 35.1 102.4                          | 12.9 98.8         |
| 8       | 21.2 71.0                                  | 68.2 333.2                            | 5.4 14.5                                   | 30.1 97.9                          | 44.8 147.2                          | 15.4 132.8        |
| 9       | 26.9 97.9                                  | 73.6 406.8                            | 7.9 22.4                                   | 38.6 136.5                         | 57.2 204.3                          | 18.6 173.6        |
| 10      | 34.2 132.1                                 | 79.4 486.2                            | 11.6 34.0                                  | 49.5 186.0                         | 73.0 277.3                          | 22.5 223.1        |
| 11      | 37.6 169.7                                 | 80.7 566.9                            | 13.7 47.7                                  | 54.2 240.2                         | 78.4 355.7                          | 24.0 276.0        |
| 12      | 41.3 211.0                                 | 81.9 648.8                            | 16.1 63.8                                  | 59.4 299.6                         | 84.1 439.9                          | 25.7 332.6        |

Source: Center for Urban Forest Research, CUFR Model, USDA, 2008

## Statewide Measures Reductions

For climate action planning purposes, baseline GHG emissions are projected under a business-as-usual scenario to a future year, assuming that conditions and consumption rates occurring in the baseline year would continue. However, even without local climate action planning, statewide measures and regulations would affect future business-as-usual GHG emissions.

Estimates of the local effect of statewide reduction measures should be conservative to avoid overestimating GHG reductions. In many cases, the regulation may not have the same effectiveness at a particular local level as it does on a statewide level. Furthermore, some regulations that affect certain industries or practices may occur more frequently in one jurisdiction than another and therefore various levels of statewide reductions would be anticipated in each jurisdiction. Therefore, AECOM has selected the following statewide reduction measures that would create reasonably foreseeable emissions reductions attributable to Shasta Lake at a local level.

## Renewable Portfolio Standard

Executive Order S-21-09 established a statewide renewable energy portfolio target of 33% by year 2020. Therefore, California utilities, including PG&E, will increase their renewable portfolio standard (RPS) to at least 33% by year 2020. The GHG reductions associated with the RPS were estimated by evaluating PG&E's RPS increase from baseline year 2008 to year 2020 and 2035. PG&E's year 2008 baseline RPS-eligible electricity sources were determined to be approximately 12%. However, PG&E also maintains other renewable electricity sources that don't qualify for RPS (e.g., large hydroelectric sources); however, would also not generate GHG emissions. These non-RPS eligible sources account for approximately 20% of PG&E's year 2008 baseline electricity portfolio. Therefore, the anticipated change from baseline year 2008 to year 2020 is a 21% increase in RPS sources (i.e.,  $33\% - 12\% = 21\%$ ). Assuming that PG&E will only focus on RPS-eligible sources, year 2020 renewable portfolio would be approximately 53% (i.e.,  $33\% \text{ RPS} + 20\% \text{ non-RPS} = 53\%$ ). Although it is likely that PG&E would add additional RPS and non-RPS sources between 2020 and 2035, or that new regulations would require an increase in RPS sources, for a conservative analysis, the projections assume the 33% RPS and 20% non-RPS eligible renewable sources remained constant between 2020 and 2035. Table B-16 presents calculations used to estimate GHG emission reductions associated with the RPS.

| <b>Table B-16<br/>Communitywide Renewable Portfolio Standard Calculations</b>                                   |             |             |
|---|-------------|-------------|
| <b>Parameter</b>  | <b>2020</b> | <b>2035</b> |
| Total Business-As-Usual Electricity Emissions (MT CO <sub>2</sub> e/yr)   | 15,389      | 18,235      |
| Business-As-Usual RPS <sup>1</sup>  | 12%         | 12%         |
| Target RPS  | 33%         | 33%         |
| Additional RPS Percent Increase   | 21%         | 21%         |
| Total Renewable, Non-Carbon Electricity Sources   | 53%         | 53%         |
| Total Electricity Emissions with RPS Target (MT CO <sub>2</sub> e/yr)<br>(Electricity BAU × (1-Additional RPS)) | 10,636      | 12,604      |
| Emission Reduction (MT CO <sub>2</sub> e/yr)  | 4,752       | 5,632       |

Notes: MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalent per year; BAU = business as usual; RPS = renewable portfolio standard

<sup>1</sup> Business-as-usual renewable portfolio standard (RPS) (year 2008) and non-RPS eligible resources were obtained from Pacific Gas and Electric.

Source: AECOM 2012

## Scoping Plan Transportation Measures

The AB 32 Climate Change Scoping Plan (Scoping Plan) has established several statewide measures that will contribute to California achieving its GHG reduction goal. Several statewide measures would affect the transportation-related business-as-usual emissions. In order to account for GHG reductions associated with Pavley I and the Low Carbon Fuel Standard (LCFS), the ARB-approved Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0 was used to estimate reductions from EMFAC2007 outputs (ARB 2010b). Table B-17 presents GHG emission reductions associated with Pavley I and the LCFS transportation measures.

The AB 32 Scoping Plan includes other transportation measures that would reduce motor vehicle emissions on a statewide level, which are not estimated in any ARB-approved models. AECOM has selected Heavy-Duty Vehicle Aerodynamic Efficiency, Light-Duty Vehicle Tire Pressure, and Pavley II as measures that can be reasonably assumed to be implemented and affect transportation emissions within Anderson. To estimate the local effect of these reductions, AECOM divided the anticipated transportation emission reductions associated with the Scoping Plan transportation measures by the ARB-projected 2020 transportation emissions to estimate the percent reduction in transportation emissions attributed to implementation of the Scoping Plan. The percent reduction achieved by these measures from the state's total transportation sector was applied to the City's business-as-usual transportation emissions. This method assumes that the City will achieve the same relative level of transportation emission reductions associated with transportation measures as the Scoping Plan assumes at the statewide level. Table B-18 presents calculations used to estimate GHG emission reductions associated with the Heavy-Duty Vehicle Aerodynamic Efficiency, Light-Duty Vehicle Tire Pressure, and Pavley II transportation measures.

**Table B-17**  
**Pavley I and Low Carbon Fuel Standard Emission Reductions**

| Transportation Measure   | Preferred Project<br>(MT CO <sub>2</sub> e/yr) |               |
|--------------------------|--|---------------|
|                          | 2020   | 2035          |
| Pavley I                 | 35,421   | 66,274        |
| Low Carbon Fuel Standard | 15,173   | 16,146        |
| <b>Total</b>             | <b>50,594</b>                                  | <b>82,420</b> |

Notes: MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalents per year.

Source: AECOM 2012, ARB 2010b

**Table B-18**  
**Communitywide Scoping Plan Measures Calculations**

| Energy Source and Year                                     | Statewide Total Emissions (MMT CO <sub>2</sub> e/yr) <sup>1</sup> | AB 32 Scoping Plan Reductions (MMT CO <sub>2</sub> e/yr) <sup>2</sup> | Percent Reduction | Shasta Lake Total Emissions (MT CO <sub>2</sub> e/yr) | Shasta Lake Total Emissions with Reduction Measure (MT CO <sub>2</sub> e/yr) | Emission Reductions (MT CO <sub>2</sub> e/yr) |
|--|---|---|-------------------|---|--|---|
| <b>Med- and Heavy-Duty Vehicle Efficiency <sup>3</sup></b> |   |   |                   |   |  |   |
| 2020   | 168.10  | 1.4   | 0.03%             | 56,520  | 56,174   | 346   |
| 2035 <sup>4</sup>  | 168.10  | 1.4   | 0.03%             | 73,953  | 73,491   | 462   |
| <b>Pavley II</b>   |   |   |                   |   |  |   |
| 2020   | 168.10  | 4.0   | 2.4%              | 56,520  | 55,093   | 1,427   |
| 2035 <sup>4</sup>  | 168.10  | 4.0   | 2.4%              | 73,953  | 72,105   | 1,848   |
| <b>Total Reductions</b>                                    |   |   |                   |   |  |   |
| 2020   | -   | -   | -                 | -   | -  | 19,153 <sup>5</sup>                           |
| 2035 <sup>4</sup>  | -   | -   | -                 | -   | -  | 36,012 <sup>5</sup>                           |

Notes: MMT CO<sub>2</sub>e/yr = million metric tons of carbon dioxide equivalent per year; MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalent per year.

<sup>1</sup> Obtained from the ARB's 2020 projected inventory.

<sup>2</sup> Obtained from ARB's updated AB 32 Scoping Plan implementation schedule.

<sup>3</sup> Combines two AB 32 Scoping Plan action items: Heavy-Duty Vehicle Aerodynamic Efficiency Program and Medium- and Heavy-Duty Vehicle Hybridization Program

<sup>4</sup> ARB has not projected California statewide emissions or emission reductions associated with the AB 32 Scoping Plan out to year 2035. It is anticipated that additional efficiency could increase the measures reductions; however, the same level of reductions was assumed for both 2020 and 2035.

<sup>5</sup> Total reductions equal the sum of emissions reductions from Pavley I and Low Carbon Fuel Standard (see Table B-15) and the transportation measures described and presented above.

Source: AECOM 2012, ARB 2010c, ARB 2011.

## 2008 and 2013 California Title-24 Standards

### ***Impact of 2008 Title-24***

The first step of this analysis estimates the reduction in energy-related emissions (i.e., electricity and natural gas) associated with new buildings constructed from January 2010 through December 2013. This construction is subject to the current (2008) Title 24 energy code and therefore more efficient than buildings constructed under the 2005 Title 24 energy code requirements. Business-as-usual electricity and natural gas consumption levels for residential and non-residential construction were established using the CEC's Residential Appliance Saturation Survey data and the Commercial End Use Survey data for Forecast Climate Zone 3. The California Energy Commission's (CEC) report entitled *Impact Analysis - 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings* provides data on the energy savings potential of construction subject to 2008 requirements compared to construction subject to the 2005 baseline requirements. This savings potential was applied to projected levels of residential and non-residential construction for the jurisdiction (see Table B-19).

| Table B-19<br>Impact of 2008 T-24 on Building Energy Use |               |                  |
|--|---------------|------------------|
| Residential - Local Climate Zone                         |               |                  |
| Title-24 Period  | kWH/unit/year | therms/unit/year |
| T-24 2005 Residential (SFR) Energy Use                   | 7,514         | 364              |
| T-24 2008 Residential (SFR) Energy Use                   | 7,410         | 316              |
| % difference   | -1.4%         | -13.1%           |
| Non-Residential - Local Climate Zone                     |               |                  |
| Title-24 Period  | kWH/unit/year | kBTU/unit/year   |
| T-24 2005 Residential (SFR) Energy Use                   | 13.64         | 29.49            |
| T-24 2008 Residential (SFR) Energy Use                   | 13.04         | 25.45            |
| % difference   | -4.4%         | -13.7%           |

Note:

-Used RASS 'SFR' category for residential.

-Used CEUS 'All Commercial' category for non-residential.

### ***Impact of 2013 Title-24***

The second step of this analysis estimates the reduction in energy-related emissions (i.e., electricity and natural gas) associated with new buildings constructed from January 2014 forward. The CAPCOA report *"Quantifying Greenhouse Gas Mitigation Measures"* provides a methodology for calculating the reduction in energy-related emissions (i.e., electricity and natural gas) resulting from new construction built to energy efficiency standards above the current (2008) Title 24 energy code. The methodology

calculates the reduction in electricity and natural gas consumption for each percent increase over current Title 24 standards per residential and non-residential building type and climate zone.

Baseline electricity and natural gas consumption levels per residential unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3. Mitigated levels of electricity and natural gas consumption levels per building type were calculated using the CAPCOA methodology. The measure assumes that all new buildings constructed after January 2014 will exceed 2008 Title 24 energy standards by 25%. This assumption was based on the following CEC press release. [http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013\\_Building\\_Energy\\_Efficiency\\_Standards\\_FAQ.pdf](http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013_Building_Energy_Efficiency_Standards_FAQ.pdf)

### ***Building Construction Projections***

Projections of new residential development were developed from SCTPA traffic model inputs. Projections for new non-residential development were developed by using existing non-residential building area data from the County Assessors database and assuming the SCTPA traffic model employment growth rate to estimate growth in non-residential building stock.

# CITY OF SHASTA LAKE





## GREENHOUSE GAS REDUCTION MEASURE QUANTIFICATION METHODOLOGY

This appendix summarizes the methodology for quantifying greenhouse gas (GHG) reductions resulting from implementing the Climate Action Plan (CAP) measures. Calculations and/or background information are only shown for horizon year 2020. Energy emissions factors based on an RPS-compliant energy source mix were used to quantify emissions reductions for all measures resulting in electricity savings to avoid double counting.

### Measure BE-1: Energy Efficiency Retrofits

This measure estimates the reduction in energy-related emissions (i.e., electricity and natural gas) resulting from retrofitting existing residential units and commercial properties. The measure includes retrofitting both single- and multi-family units based on a pre-defined package of energy efficiency retrofits that include installation of programmable thermostats, gas water heater upgrades, installation of high-efficiency light bulbs, gas furnace upgrades, duct sealing, foundation insulation, and building envelope sealing/weatherization.

Baseline electricity and natural gas consumption levels per unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3, which covers 85 to 95 percent of Shasta County. Mitigated energy savings estimates were based on outputs from Lawrence Berkeley Laboratory's Home Energy Saver™ building energy modeling software. The model-derived energy savings estimates were downscaled in order to be conservative in emissions reduction calculations. Total energy savings were calculated by subtracting the mitigated electricity and natural gas consumption levels from baseline levels. See Table B-1 for data used to calculate emissions reductions.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|------|--|---|--|
| 2020 | 2% of existing single family residential units perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, AC refrigerant recharge) | 25 MT CO <sub>2</sub> e/yr              | <i>Building Data: Shasta County Assessor's Office parcel data</i><br><br><i>Baseline Energy Consumption: Commercial End Use Survey, CEC, 2006</i><br><br><i>Energy Savings from Retrofit Packages: AECOM SSIMe™ Building Energy Analysis</i>     |
|      | 2% of multi-family residential units perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, AC refrigerant recharge)           |   | <i>Baseline Energy Consumption: Residential Appliance Saturation Survey, CEC, 2010</i><br><br><i>Energy Savings from Retrofit Packages: SSIMe Building Energy Model, AECOM 2011</i><br><br><i>Participation Rates: City of Shasta Lake, 2012</i> |

### Measure BE-2: New Construction

Reductions associated with this measure are described in Statewide Measures Reductions on page B-76.

**Table B-1**  
**Residential Retrofits**

| <b>Baseline Energy Consumption</b>  |                    |                           |                      |                         |                        |                          |
|-------------------------------------|--------------------|---------------------------|----------------------|-------------------------|------------------------|--------------------------|
|                                     | <b>Total Units</b> | <b>Participation Rate</b> | <b>kWh/unit/year</b> | <b>therms/unit/year</b> | <b>Total kWhr/year</b> | <b>Total therms/year</b> |
| Single Family                       | 3,093              | 2%                        | 8,836                | 562                     | 546,595                | 34,743                   |
| Townhome                            | 25                 | 2%                        | 5,762                | 327                     | 2,881                  | 163                      |
| 2-4 unit apartment                  | 225                | 2%                        | 4,595                | 305                     | 20,678                 | 1,375                    |
| 5+ unit apartment                   | 104                | 2%                        | 5,248                | 199                     | 10,916                 | 413                      |
| Mobile Home                         | 441                | 0%                        | na                   | na                      | na                     | na                       |
| <b>Total</b>                        | <b>3,888</b>       |                           |                      |                         | <b>581,069</b>         | <b>36,695</b>            |
| <b>Mitigated Energy Consumption</b> |                    |                           |                      |                         |                        |                          |
|                                     | <b>Total Units</b> | <b>Participation Rate</b> | <b>kWh/unit/year</b> | <b>therms/unit/year</b> | <b>Total kWhr/year</b> | <b>Total therms/year</b> |
| Single Family                       | 3,093              | 2%                        | 8,836                | 489                     | 546,595                | 30,275                   |
| Townhome                            | 25                 | 2%                        | 5,722                | 305                     | 2,861                  | 153                      |
| 2-4 unit apartment                  | 225                | 2%                        | 4,566                | 272                     | 20,548                 | 1,225                    |
| 5+ unit apartment                   | 104                | 2%                        | 5,217                | 189                     | 10,851                 | 393                      |
| Mobile Home                         | 441                | 0%                        | na                   | na                      | na                     | na                       |
| <b>Total</b>                        | <b>3,888</b>       |                           |                      |                         | <b>580,855</b>         | <b>32,045</b>            |
| <b>Energy Savings</b>               |                    |                           |                      |                         | <b>215</b>             | <b>4,649</b>             |

**Measure BE-3: Commercial Lighting**

This measure estimates the reduction in electricity-related emissions resulting from indoor and outdoor light retrofits within commercial land uses. Baseline lighting electricity loads per square foot per non-residential use type were identified using CEC's Commercial End Use Survey data for Forecast Climate Zone 3 (see Table B-2).

The measure assumes that indoor lighting retrofits would occur at a performance level identified within the State's *Database for Energy Efficient Resources*. For 2020, the City assumes that 90% of total community-wide nonresidential square footage would implement a 40% indoor lighting load reduction. It was also assumed that 20% of total community-wide nonresidential square footage would implement a 20% exterior lighting load reduction. All non-residential uses (office, retail, and warehouse) are included in these calculations. Participation rates also reflect the assumption that State and federal light bulb efficiency standards (i.e. Energy Independence and Security Act of 2007) will assist in the implementation of this measure.

| Year        | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|-------------|--|---|---|
| <b>2020</b> | 90% of businesses improve interior lighting efficiency by 40%  | 137 MT CO <sub>2</sub> e/yr             | <i>Baseline Energy Consumption: Commercial End Use Survey, CEC, 2006</i>  |
|             | 20% of businesses improve exterior lighting efficiency by 20%. |   | <i>Energy Savings from Retrofit Packages: CEC/CPCU Database for Energy Efficient Resources, 2005</i><br><br><i>Participation Rates: City of Shasta Lake, 2011</i> |

**Table B-2**  
**Indoor and Exterior Lighting Energy**

| Commercial Use Type | Baseline (kWh/SF/Year) | Mitigated (kWh/SF/Year) |
|---------------------|------------------------|-------------------------|
| Grocery             | 36.27                  | 33.31                   |
| Health              | 15.04                  | 13.54                   |
| Lodging             | 10.07                  | 9.44                    |
| Large Office        | 14.20                  | 12.62                   |
| Restaurant          | 33.25                  | 30.81                   |
| Retail              | 10.06                  | 8.43                    |
| School              | 8.82                   | 7.63                    |
| Small Office        | 9.40                   | 8.26                    |
| Warehouse (All)     | 22.67                  | 21.55                   |

Source: CEC 2006

### Measure BE-4: Efficient Appliances

This measure estimates the reduction in electricity-related emissions resulting from installing energy-efficient appliances in new and existing residential units. This measure focuses on installation of energy-efficient refrigerators, clothes washers, and dishwashers. The CAPCOA report *“Quantifying Greenhouse Gas Mitigation Measures”* provides a methodology for calculating the electricity reductions associated with the installation of energy-efficient refrigerators, clothes washers, and dishwashers. The City selected participation rates on the assumption that State and utility outreach programs will increase the market share of ENERGY STAR appliances above current levels. Baseline market share values from a *Northwestern Energy Alliance* study indicate that approximately 33% of consumers purchase ENERGY STAR refrigerators, 83% purchase ENERGY STAR dishwashers, and 36% purchase ENERGY STAR clothes washers. The study shows a strong trend of increasing ENERGY STAR appliance market share over the past decade. For 2020, the City assumes that additional outreach and rebates will further increase the ENERGY STAR appliance market share in Shasta Lake. For new residential units, the measure assumes use of energy-efficient refrigerators will increase to a market share of 80%, use of energy-efficient clothes washers will increase to a market share of 90%, and use of energy-efficient dishwashers will increase to a market share of 90%. The City assumes that 20% of existing residential units will install energy-efficient refrigerators, clothes washers, and dishwashers.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | 20% of existing homes will replace old model refrigerators, dishwashers, and clothes washers with new Energy Star models | 173 MT CO <sub>2</sub> e/yr             | <p><i>Quantification Methodology: Energy Efficient Appliance Reduction: CAPCOA. 2010 (August). Quantifying Greenhouse Gas Mitigation Measures. Available: &lt;<a href="http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf">http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf</a>&gt;.</i></p> <p><i>Participation Rates: ENERGY STAR Consumer Products Program: Market Progress Evaluation Report. Prepared by KEMA, Inc. July 24, 2007. Prepared for Northwestern Energy Efficiency Alliance.</i></p> |
|      | 80% of new homes will install Energy Star refrigerators  |   |   |
|      | 90% of new homes will install Energy Star dishwashers and clothes washers  |   |   |

### Measure BE-5: Solar Water Heaters

This measure quantifies natural gas and electricity-related emissions reductions resulting from the installation of solar hot water heaters in residential units and commercial buildings. Baseline water heating-related natural gas consumption levels per residential unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3. In addition, CEC data identifies the energy savings potential of solar hot water heaters for specific climates in California. The measure assumes that 40-67% of water-heating natural gas can be reduced through the use of solar hot water heaters. The measure assumes that 10% of all residential units (i.e., single family and multi-family) and 10% of all commercial buildings will install solar hot water heaters to meet their hot water demands. Care should be taken to avoid double-counting between a solar hot water heater installed to help new residential units achieve the building code-mandated energy efficiency performance and solar hot water heaters installed in excess of that requirement. Table B-3 provides the assumptions used to quantify reductions from solar water heaters.

| Year        | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|-------------|---|---|---|
| <b>2020</b> | 10% of residences and commercial buildings install a solar hot water system | 254 MT CO <sub>2</sub> e/yr             | <i>Baseline Hot Water Natural Gas Consumption: Residential Appliance Saturation Survey, CEC, 2010</i><br><br><i>Solar Fraction: Solar Water Heating CEC 2013 Title 24 Pre-rulemaking Workshop, California Energy Commission, June 9, 2011</i><br><br><i>Solar Insolation: National Renewable Energy Laboratory Renewable Resource Data Center, 2011</i><br><br><i>PV Participation Rates: City of Shasta Lake, 2012</i> |

**Table B-3**  
**Solar Water Heaters – 2020**

| <b>Residential Units</b>    |                 |   |  |   |                                       |                                |
|-----------------------------|-----------------|---|--|---|---------------------------------------|--------------------------------|
|                             | Units<br>(2020) | Hot Water<br>Heater Energy<br>per Unit<br>(therms/year) | Solar Water<br>Heater<br>Effectiveness | Energy Savings<br>per Unit<br>(therms/year) | Participation<br>Rate<br>(% of units) | Total Savings<br>(therms/year) |
| Single Family               | 3,281           | 196   | 67%                                    | 131.54                                      | 10%                                   | 43,152                         |
| Townhouse                   | 27              | 170   | 67%                                    | 114.15                                      | 10%                                   | 303                            |
| 2-4 unit apartment          | 239             | 135   | 59%                                    | 79.65                                       | 10%                                   | 1,901                          |
| 5+ unit apartment           | 110             | 84  | 59%                                    | 49.30                                       | 10%                                   | 544                            |
| <b>Total</b>                | <b>3,656</b>    | -   | -                                      | -   | -                                     | <b>45,899</b>                  |
| <b>Commercial Buildings</b> |                 |   |  |   |                                       |                                |
|                             | SQFT<br>(2020)  | Hot Water<br>Heater Energy<br>per SQFT<br>(kBtu/year)   | Solar Water<br>Heater<br>Effectiveness | Energy Savings<br>per SQFT<br>(kBtu/year)   | Participation<br>Rate<br>(% of SQFT)  | Total Savings<br>(kBtu/year)   |
| All Warehouse               | 171,073         | 0.00  | 40%                                    | 0.00  | 10%                                   | 0                              |
| Grocery                     | 23,731          | 0.00  | 40%                                    | 0.00  | 10%                                   | 0                              |
| Health                      | 23,276          | 17.34   | 40%                                    | 6.93  | 10%                                   | 16,141                         |
| Lodging                     | 10,869          | 14.27   | 40%                                    | 5.71  | 10%                                   | 6,204                          |
| Restaurant                  | 22,535          | 29.95   | 40%                                    | 11.98                                       | 10%                                   | 26,992                         |
| Retail                      | 77,704          | 1.91  | 40%                                    | 0.77  | 10%                                   | 5,951                          |
| School                      | 7,966           | 9.55  | 40%                                    | 3.82  | 10%                                   | 3,042                          |
| Small Office                | 6,834           | 1.23  | 40%                                    | 0.49  | 10%                                   | 337                            |
| <b>Total</b>                | <b>346,008</b>  | -   | -                                      | -   | -                                     | <b>58,668</b>                  |



### Measure BE-6: Solar Photovoltaic Systems

This measure estimates the reduction in electricity-related emissions resulting from installation of grid connected photovoltaic (PV) systems in residential and commercial uses. The measure uses National Renewable Energy Laboratory solar insolation data specific to Shasta Lake's geographic location and climate. For 2020, it was assumed that approximately 3% of single-family and town-home units would install 3-kilowatt grid-connected PV systems. It was also assumed that 1.5 MW of non-residential PV systems would be installed. See Table B-4 for calculations and assumptions associated with this measure.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|---|---|
| 2020 | 3% of single-family homes install 3.0 kW solar PV systems           | 867 MT CO <sub>2</sub> e/yr             | <i>Solar Insolation: National Renewable Energy Laboratory Renewable Resource Data Center, 2011</i>                          |
|      | 100,000 SF of non-residential PV systems installed in the community |   | <i>Participation rates: City of Shasta Lake, 2012.</i><br><i>Building Data: Shasta County Assessor's Office parcel data</i> |

**Table B-4**  
**Solar PV Systems – 2020**

| Single-Family Residential                         |                     |                                      |                                  |
|---|---------------------|--------------------------------------|----------------------------------|
| Photovoltaic System Size per Unit (kW)            | Number of SFR Units | Generation Potential (kWh/sqft/year) | Electricity Generated (kWh/year) |
| 3.0   | 99                  | 166                                  | 493,547                          |
| Multi-Family Residential and Commercial           |                     |                                      |                                  |
| Total Photovoltaic System Capacity Installed (MW) | Area (sqft)         | Generation Potential (kWh/sqft/Year) | Electricity Generated (kWh/Year) |
| 1.5   | 100,000             | 166                                  | 2,487,270                        |
| <b>Total Electricity Generated (kWh/Year)</b>     |                     |                                      | <b>2,980,817</b>                 |

### Measure W-1: Water Conservation

To estimate GHG reductions associated with implementation of the City's proposed water conservation strategies, water demand data for 2008 from the City and population and employment growth projections from the SRTA traffic model were used to establish base-case and future year estimates under business-as-usual-and mitigated scenarios. Annual water savings were calculated by subtracting the mitigated scenario demand from the base-case scenario demand in both 2020 and 2035. The annual water savings were translated into GHG reductions by applying water-energy intensity factors (kWh/million gallons/year) and California-wide electricity-generation emissions factors (MT CO<sub>2</sub>e/kWh/year). Separate water-energy intensity factors were applied to indoor and outdoor portions of water savings. The ratio of indoor water to outdoor water was based on estimates typical of northern central valley water use. See Table B-5 for assumptions and calculations used to quantify reductions from this measure.

| Year        | Progress Indicators                      | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|-------------|--|---|--|
| <b>2020</b> | 20% reduction in per capita water demand | 314 MT CO <sub>2</sub> e/yr             | Navigant Consulting, Inc. 2006. Refining Estimates of Water-Related Energy Use in California. California Energy Commission |

**Table B-5**  
**Senate Bill 7X: Per Capita Water Reduction**

| 2008 Water Consumption                       |                             |                        |                           |   |  |                              |                              |
|--|-----------------------------|------------------------|---------------------------|---|--|------------------------------|------------------------------|
| Total Demand (AF/yr)                         | Percent Urban Water Use (%) | Total Urban Water (AF) | Baseline Population       | Per Capita Water Consumption (AF/capita/yr)     |  |                              |                              |
| 2,853  | 100%                        | 2,853                  | 10,069                    | 0.283   |  |                              |                              |
| 2020 Water Consumption                       |                             |                        |                           |   |  |                              |                              |
| Total Demand (AF/yr)                         | Percent Urban Water Use (%) | Total Urban Water (AF) | Horizon Year 1 Population | BAU Per Capita Water Consumption (AF/capita/yr) | SB 7 Per Capita Water Consumption (AF/capita/yr) |                              |                              |
| 3,210  | 100%                        | 3,210                  | 11,210                    | 0.286   | 0.227  |                              |                              |
| 2020 Water Savings                           |                             |                        |                           |   |  |                              |                              |
| Total AF/yr (without SB 7X)                  |                             |                        |                           | 3,210   |  |                              |                              |
| Total AF/yr (with SB 7X)                     |                             |                        |                           | 2,541   |  |                              |                              |
| Water Savings (AF/yr)                        |                             |                        |                           | 669   |  |                              |                              |
| Indoor/Outdoor Water Use Assumption          |                             |                        |                           |   |  |                              |                              |
| Indoor % of total                            |                             |                        |                           | 45%   |  |                              |                              |
| Outdoor % of total                           |                             |                        |                           | 55%   |  |                              |                              |
| GHG Emission Reductions (indoor water)       |                             |                        |                           |   |  |                              |                              |
| Water Energy Intensity (KWh/acre feet /year) | acre-ft/year                | Total KWh              | MWh                       | Emission Factor (lb CO2/MWh)                    | Emission Factor (lb CH4/MWh)                     | Emission Factor (lb N2O/MWh) | Total CO2e Reduced (MT/year) |
| 1763   | 301                         | 530,916                | 531                       | 724.12  | 0.0302   | 0.0081                       | 175                          |
| GHG Emission Reductions (outdoor water)      |                             |                        |                           |   |  |                              |                              |
| Water Energy Intensity (KWh/acre feet /year) | acre-ft/year                | Total KWh              | MWh                       | Emission Factor (lb CO2/MWh)                    | Emission Factor (lb CH4/MWh)                     | Emission Factor (lb N2O/MWh) | Total CO2e Reduced (MT/year) |
| 1140   | 368                         | 419,727                | 420                       | 724.12  | 0.0302   | 0.0081                       | 138                          |
| TOTAL  | 669                         | 950,643                | 951                       |   |  |                              | 314                          |

### Measure SW-1: Enhanced Organic Waste Diversion

An inventory of the community's organic waste was created using Cal Recycle waste volume and characterization data. Using the first-order decay methodology from the 2006 IPCC guidelines, fugitive methane emissions from the organic landfill waste were calculated for base-case and mitigated scenarios. This measure assumes that residential and commercial uses will divert 50% of yard waste (highlighted in green in Tables B-7 and B-8) and construction/demolition waste (highlighted in blue in Tables B-6 and B-7) from landfills by 2020. This measure would apply to GHG emissions associated with new waste generated and would not apply to waste in place disposed prior to CAP implementation.

Calculations for this measure factored in the advanced methane recovery rate described in Measure SW-2 to avoid double counting emissions reductions.

| Year | Progress Indicators   | GHG Reduction<br>(MT CO <sub>2</sub> e/yr) | Sources   |
|------|---|--|---|
| 2020 | Community increases diversion of yard waste by 50%                        | 118 MT CO <sub>2</sub> e/yr                | <i>CalRecycle Waste Characterization Data, 2011</i><br><br><i>IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5 Chapter 3.</i> |
|      | Community increases diversion of construction and demolition waste by 50% |  |   |

**Table B-6**  
**Baseline Degradable Organic Carbon Disposed**

**Commercial Waste – Baseline Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/ Demolition | Sludge/ Manure | Total |
|------|-----------|--------------|------------------|--------------|------|-------|--------|----------|--------|----------|---------|--------------------------|----------------|-------|
| 2008 | 2.2       | 16.8         | 31.4             | 17.2         | 40.3 | 1.7   | 6.6    | 6.4      | 47.4   | 15.9     | 8.4     | 3.5                      | 0.0            | 197.8 |
| 2009 | 2.2       | 17.0         | 31.7             | 17.4         | 40.7 | 1.7   | 6.7    | 6.4      | 47.9   | 16.1     | 8.5     | 3.6                      | 0.0            | 199.7 |
| 2010 | 2.2       | 17.2         | 32.0             | 17.6         | 41.1 | 1.7   | 6.8    | 6.5      | 48.3   | 16.2     | 8.5     | 3.6                      | 0.0            | 201.7 |
| 2011 | 2.2       | 17.3         | 32.3             | 17.7         | 41.5 | 1.7   | 6.8    | 6.6      | 48.8   | 16.4     | 8.6     | 3.6                      | 0.0            | 203.7 |
| 2012 | 2.2       | 17.5         | 32.6             | 17.9         | 41.9 | 1.8   | 6.9    | 6.6      | 49.3   | 16.5     | 8.7     | 3.7                      | 0.0            | 205.7 |
| 2013 | 2.3       | 17.7         | 32.9             | 18.1         | 42.3 | 1.8   | 7.0    | 6.7      | 49.8   | 16.7     | 8.8     | 3.7                      | 0.0            | 207.7 |
| 2014 | 2.3       | 17.9         | 33.3             | 18.3         | 42.8 | 1.8   | 7.0    | 6.8      | 50.3   | 16.9     | 8.9     | 3.7                      | 0.0            | 209.8 |
| 2015 | 2.3       | 18.0         | 33.6             | 18.4         | 43.2 | 1.8   | 7.1    | 6.8      | 50.8   | 17.0     | 9.0     | 3.8                      | 0.0            | 211.9 |
| 2016 | 2.3       | 18.2         | 33.9             | 18.6         | 43.6 | 1.8   | 7.2    | 6.9      | 51.3   | 17.2     | 9.1     | 3.8                      | 0.0            | 213.9 |
| 2017 | 2.4       | 18.4         | 34.3             | 18.8         | 44.0 | 1.9   | 7.2    | 7.0      | 51.8   | 17.4     | 9.1     | 3.8                      | 0.0            | 216.1 |
| 2018 | 2.4       | 18.6         | 34.6             | 19.0         | 44.5 | 1.9   | 7.3    | 7.0      | 52.3   | 17.5     | 9.2     | 3.9                      | 0.0            | 218.2 |
| 2019 | 2.4       | 18.8         | 34.9             | 19.2         | 44.9 | 1.9   | 7.4    | 7.1      | 52.8   | 17.7     | 9.3     | 3.9                      | 0.0            | 220.4 |
| 2020 | 2.4       | 19.0         | 35.3             | 19.4         | 45.4 | 1.9   | 7.5    | 7.2      | 53.3   | 17.9     | 9.4     | 4.0                      | 0.0            | 222.5 |

**Residential Waste – Baseline Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food  | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/ Demolition | Sludge/ Manure | Total |
|------|-----------|--------------|------------------|--------------|-------|-------|--------|----------|--------|----------|---------|--------------------------|----------------|-------|
| 2008 | 8.8       | 31.4         | 25.3             | 40.0         | 135.1 | 5.2   | 12.6   | 5.3      | 39.1   | 36.9     | 43.2    | 3.2                      | 0.1            | 386.3 |
| 2009 | 8.9       | 31.7         | 25.5             | 40.4         | 136.4 | 5.3   | 12.7   | 5.4      | 39.4   | 37.3     | 43.6    | 3.2                      | 0.1            | 390.1 |
| 2010 | 8.9       | 32.0         | 25.8             | 40.8         | 137.8 | 5.3   | 12.9   | 5.4      | 39.8   | 37.7     | 44.1    | 3.2                      | 0.1            | 393.9 |
| 2011 | 9.0       | 32.4         | 26.1             | 41.2         | 139.2 | 5.4   | 13.0   | 5.5      | 40.2   | 38.0     | 44.5    | 3.3                      | 0.1            | 397.8 |
| 2012 | 9.1       | 32.7         | 26.3             | 41.6         | 140.5 | 5.4   | 13.1   | 5.5      | 40.6   | 38.4     | 44.9    | 3.3                      | 0.1            | 401.7 |
| 2013 | 9.2       | 33.0         | 26.6             | 42.0         | 141.9 | 5.5   | 13.3   | 5.6      | 41.0   | 38.8     | 45.4    | 3.3                      | 0.1            | 405.7 |
| 2014 | 9.3       | 33.3         | 26.8             | 42.5         | 143.3 | 5.5   | 13.4   | 5.6      | 41.4   | 39.2     | 45.8    | 3.4                      | 0.1            | 409.7 |
| 2015 | 9.4       | 33.7         | 27.1             | 42.9         | 144.7 | 5.6   | 13.5   | 5.7      | 41.8   | 39.6     | 46.3    | 3.4                      | 0.1            | 413.8 |
| 2016 | 9.5       | 34.0         | 27.4             | 43.3         | 146.2 | 5.6   | 13.7   | 5.7      | 42.3   | 40.0     | 46.7    | 3.4                      | 0.1            | 417.9 |
| 2017 | 9.6       | 34.3         | 27.6             | 43.7         | 147.6 | 5.7   | 13.8   | 5.8      | 42.7   | 40.4     | 47.2    | 3.5                      | 0.2            | 422.0 |
| 2018 | 9.7       | 34.7         | 27.9             | 44.2         | 149.1 | 5.7   | 13.9   | 5.8      | 43.1   | 40.8     | 47.7    | 3.5                      | 0.2            | 426.2 |
| 2019 | 9.8       | 35.0         | 28.2             | 44.6         | 150.5 | 5.8   | 14.1   | 5.9      | 43.5   | 41.2     | 48.1    | 3.5                      | 0.2            | 430.4 |
| 2020 | 9.9       | 35.3         | 28.5             | 45.0         | 152.0 | 5.9   | 14.2   | 6.0      | 44.0   | 41.6     | 48.6    | 3.6                      | 0.2            | 434.6 |

**Table B-7**  
**Mitigated Degradable Organic Carbon Disposed**

**Commercial Waste – Mitigated Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/<br>Demolition | Sludge/<br>Manure | Total |
|------|-----------|--------------|------------------|--------------|------|-------|--------|----------|--------|----------|---------|-----------------------------|-------------------|-------|
| 2008 | 2.2       | 16.8         | 31.4             | 17.2         | 40.3 | 0.8   | 6.6    | 6.4      | 23.7   | 15.9     | 8.4     | 3.5                         | 0.0               | 173.2 |
| 2009 | 2.2       | 17.0         | 31.7             | 17.4         | 40.7 | 0.9   | 6.7    | 6.4      | 23.9   | 16.1     | 8.5     | 3.6                         | 0.0               | 174.9 |
| 2010 | 2.2       | 17.2         | 32.0             | 17.6         | 41.1 | 0.9   | 6.8    | 6.5      | 24.2   | 16.2     | 8.5     | 3.6                         | 0.0               | 176.7 |
| 2011 | 2.2       | 17.3         | 32.3             | 17.7         | 41.5 | 0.9   | 6.8    | 6.6      | 24.4   | 16.4     | 8.6     | 3.6                         | 0.0               | 178.4 |
| 2012 | 2.2       | 17.5         | 32.6             | 17.9         | 41.9 | 0.9   | 6.9    | 6.6      | 24.6   | 16.5     | 8.7     | 3.7                         | 0.0               | 180.2 |
| 2013 | 2.3       | 17.7         | 32.9             | 18.1         | 42.3 | 0.9   | 7.0    | 6.7      | 24.9   | 16.7     | 8.8     | 3.7                         | 0.0               | 182.0 |
| 2014 | 2.3       | 17.9         | 33.3             | 18.3         | 42.8 | 0.9   | 7.0    | 6.8      | 25.1   | 16.9     | 8.9     | 3.7                         | 0.0               | 183.8 |
| 2015 | 2.3       | 18.0         | 33.6             | 18.4         | 43.2 | 0.9   | 7.1    | 6.8      | 25.4   | 17.0     | 9.0     | 3.8                         | 0.0               | 185.6 |
| 2016 | 2.3       | 18.2         | 33.9             | 18.6         | 43.6 | 0.9   | 7.2    | 6.9      | 25.6   | 17.2     | 9.1     | 3.8                         | 0.0               | 187.4 |
| 2017 | 2.4       | 18.4         | 34.3             | 18.8         | 44.0 | 0.9   | 7.2    | 7.0      | 25.9   | 17.4     | 9.1     | 3.8                         | 0.0               | 189.3 |
| 2018 | 2.4       | 18.6         | 34.6             | 19.0         | 44.5 | 0.9   | 7.3    | 7.0      | 26.1   | 17.5     | 9.2     | 3.9                         | 0.0               | 191.1 |
| 2019 | 2.4       | 18.8         | 34.9             | 19.2         | 44.9 | 0.9   | 7.4    | 7.1      | 26.4   | 17.7     | 9.3     | 3.9                         | 0.0               | 193.0 |
| 2020 | 2.4       | 19.0         | 35.3             | 19.4         | 45.4 | 1.0   | 7.5    | 7.2      | 26.7   | 17.9     | 9.4     | 4.0                         | 0.0               | 194.9 |

**Residential Waste – Mitigated Mass of Degradable Organic Carbon Disposed (DDOC mdt)**

| Year | Newspaper | Office Paper | Corrugated Boxes | Coated Paper | Food  | Grass | Leaves | Branches | Lumber | Textiles | Diapers | Construction/<br>Demolition | Sludge/<br>Manure | Total |
|------|-----------|--------------|------------------|--------------|-------|-------|--------|----------|--------|----------|---------|-----------------------------|-------------------|-------|
| 2008 | 8.8       | 31.4         | 25.3             | 40.0         | 135.1 | 3.0   | 12.6   | 5.3      | 19.5   | 36.9     | 43.2    | 3.2                         | 0.1               | 364.5 |
| 2009 | 8.9       | 31.7         | 25.5             | 40.4         | 136.4 | 3.0   | 12.7   | 5.4      | 19.7   | 37.3     | 43.6    | 3.2                         | 0.1               | 368.1 |
| 2010 | 8.9       | 32.0         | 25.8             | 40.8         | 137.8 | 3.0   | 12.9   | 5.4      | 19.9   | 37.7     | 44.1    | 3.2                         | 0.1               | 371.7 |
| 2011 | 9.0       | 32.4         | 26.1             | 41.2         | 139.2 | 3.1   | 13.0   | 5.5      | 20.1   | 38.0     | 44.5    | 3.3                         | 0.1               | 375.4 |
| 2012 | 9.1       | 32.7         | 26.3             | 41.6         | 140.5 | 3.1   | 13.1   | 5.5      | 20.3   | 38.4     | 44.9    | 3.3                         | 0.1               | 379.1 |
| 2013 | 9.2       | 33.0         | 26.6             | 42.0         | 141.9 | 3.1   | 13.3   | 5.6      | 20.5   | 38.8     | 45.4    | 3.3                         | 0.1               | 382.8 |
| 2014 | 9.3       | 33.3         | 26.8             | 42.5         | 143.3 | 3.2   | 13.4   | 5.6      | 20.7   | 39.2     | 45.8    | 3.4                         | 0.1               | 386.6 |
| 2015 | 9.4       | 33.7         | 27.1             | 42.9         | 144.7 | 3.2   | 13.5   | 5.7      | 20.9   | 39.6     | 46.3    | 3.4                         | 0.1               | 390.5 |
| 2016 | 9.5       | 34.0         | 27.4             | 43.3         | 146.2 | 3.2   | 13.7   | 5.7      | 21.1   | 40.0     | 46.7    | 3.4                         | 0.1               | 394.3 |
| 2017 | 9.6       | 34.3         | 27.6             | 43.7         | 147.6 | 3.2   | 13.8   | 5.8      | 21.3   | 40.4     | 47.2    | 3.5                         | 0.2               | 398.2 |
| 2018 | 9.7       | 34.7         | 27.9             | 44.2         | 149.1 | 3.3   | 13.9   | 5.8      | 21.5   | 40.8     | 47.7    | 3.5                         | 0.2               | 402.1 |
| 2019 | 9.8       | 35.0         | 28.2             | 44.6         | 150.5 | 3.3   | 14.1   | 5.9      | 21.8   | 41.2     | 48.1    | 3.5                         | 0.2               | 406.1 |
| 2020 | 9.9       | 35.3         | 28.5             | 45.0         | 152.0 | 3.3   | 14.2   | 6.0      | 22.0   | 41.6     | 48.6    | 3.6                         | 0.2               | 410.1 |

### Measure SW-2: Methane Recovery

This measure estimates the reductions resulting from installation of a landfill gas recovery system at the West Central Landfill in order to comply with an adopted ARB regulation described as a discrete early action GHG emissions reduction measure in the AB 32 *Climate Change Scoping Plan*. Two landfills currently accept municipal solid waste (MSW) in Shasta County. The Anderson Landfill already has a landfill gas recovery system in place, and no efficiency upgrades are anticipated at this time. Table B-8 shows the percentage of total waste sent to each landfill that is attributed to Shasta Lake. It also shows the baseline and mitigated methane capture rate scenarios upon which emissions reductions were calculated.

This measure would apply to GHG emissions associated with new waste generated and waste-in-place disposed prior to GGRP implementation.

| Year | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources   |
|------|--|---|---|
| 2020 | West Central Landfill achieves a methane control efficiency of 75% | 2,551 MT CO <sub>2</sub> e/yr           | <i>CalRecycle Waste Characterization Data, 2011</i><br><i>IPCC, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5 Chapter 3.</i> |

| Table B-8<br>Waste Contributions per Landfill and Methane Capture Rates |  |                                      |  |
|---|--|--------------------------------------|--|
| Landfill  | Proportion of Total Refuse Received at Landfill from Shasta Lake | BAU Scenario – Methane Capture Rates | Mitigated Scenario – Methane Capture Rates |
| West Central Landfill   | 4.00%  | 0%                                   | 75%  |
| Anderson Landfill   | 1.00%  | 80%                                  | 80%  |
| Benton Landfill   | 0.00%  | 90%                                  | 90%  |

Source: Ascent Environmental, 2012

### Measure T-1: Mixed Use Development

Research demonstrates that households located in areas of mixed use development including commercial retail, employment, and schools generate lower amounts of vehicle miles traveled than households located in single use residential areas. The City of Shasta Lake estimates that 70% of all new residential units will be developed in mixed-use development areas within the City. It is estimated that the households located in these mixed use development areas will generate 6% less VMT than business as usual development in the City. See Table B-9 for calculations and assumptions used to quantify VMT reductions.

| Year | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|------|---|---|--|
| 2020 | 70% of all new residential units constructed in mixed-use development | 290 MT CO <sub>2</sub> e/yr             | <i>Housing Unit Assumptions: Shasta County Forecast Assumptions, Dowling Associates, 2011</i><br><i>Percent Mixed Use: City of Shasta Lake, 2011</i><br><i>VMT Reduction Estimate: Travel and the Built Environment, Ewing and Cervero, 2001</i> |

**Table B-9**  
**Mixed Use Development VMT Reductions**

|   | Community Vehicle Miles Traveled (miles) | Fuel Consumption (gallons) |
|---|--|----------------------------|
| <b>Total New Development BAU VMT - 2020</b>         |  |                            |
| Gasoline  | 10,812,662                               | 566,108                    |
| Diesel  | 1,135,031                                | 177,349                    |
| <b>Total</b>  | <b>11,947,692</b>                        | <b>743,456</b>             |
| <b>New Mixed Use Development VMT - 2020</b>         |  |                            |
| Gasoline  | 7,114,731                                | 372,499                    |
| Diesel  | 746,850                                  | 116,695                    |
| <b>Total</b>  | <b>7,861,582</b>                         | <b>489,194</b>             |
| <b>VMT Reductions from Mixed Use Development</b>    |  |                            |
| Gasoline  | 454,132                                  | 23,777                     |
| Diesel  | 47,671                                   | 7,449                      |
| <b>Total</b>  | <b>501,803</b>                           | <b>31,225</b>              |
| <b>Building Inventory and Reduction Assumptions</b> |  | <b>2020</b>                |
| Total New Units                                     |  | 236                        |
| New Mixed Used Units (70% of total)                 |  | 165                        |
| VMT Reduction Potential from Mixed Use Development  |  | 6%                         |

Note: Assumes average fuel efficiency of 19.1 miles/gallon for gasoline vehicles and 6.4 miles/gallon for diesel vehicles



### Measure T-2: Bicycle Lane Expansion

This measure quantifies reductions resulting from increasing Shasta Lake's bicycle mode share through expansion of its bicycle infrastructure, primarily Class I and II bicycle facilities. This measure assumes the construction of 10 miles of new Class I and II facilities by 2020. Emissions reductions come from VMT differences between a BAU scenario and a mitigated scenario (see Table B-10). The CAPCOA methodology was used to help quantify VMT reductions based on the proposed bicycle infrastructure improvements. A mode share study conducted by Dill and Carr was used to help define assumptions regarding how additional bicycle lanes translate into increased bicycle mode share (see Table B-11). The methodology assumes that the ratio of additional bicycle lane mileage per community area correlates to increased bicycle mode share, above levels reported in the 2010 US Census.

| Year        | Progress Indicators                                       | GHG Reduction<br>(MT CO <sub>2</sub> e/yr) | Sources   |
|-------------|---|--|---|
| <b>2020</b> | 10 new miles of Class I and II bicycles lanes constructed | 14 MT CO <sub>2</sub> e/yr                 | <p>CAPCOA. <i>Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emissions Reductions from Greenhouse Gas Mitigation Measures</i>. August, 2010.</p> <p>Dill, J and Carr, T. <i>Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them</i>. 2003.</p> |

| <b>Table B-10</b>   |                          |                            |
|---|--------------------------|----------------------------|
| <b>Communitywide VMT Reductions – Bicycle Infrastructure Improvements</b> |                          |                            |
| <b>BAU Scenario – Vehicles Miles Traveled</b>                             |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 85,673,144               | 4,485,505                  |
| Diesel  | 8,993,314                | 1,405,205                  |
| Total   | 94,666,458               | 5,890,710                  |
| <b>Mitigated Scenario – Vehicles Miles Traveled</b>                       |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 85,651,808               | 4,484,388                  |
| Diesel  | 8,991,074                | 1,404,855                  |
| Total   | 94,642,881               | 5,889,243                  |
| <b>BAU minus Mitigated Scenario</b>                                       |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 21,337                   | 1,117                      |
| Diesel  | 2,240                    | 350                        |
| <b>Total</b>  | <b>23,577</b>            | <b>1,467</b>               |

| <b>Table B-11</b>  |      |
|--|------|
| <b>Bicycle Infrastructure Assumptions</b>  |      |
| Land Area of Community (sq miles)  | 10.5 |
| <b>Existing Scenario</b>   |      |
| Bike Lanes (Class I and II)  | 10   |
| Bike Lanes/sq mile   | 0.95 |
| <b>Mitigated Scenario</b>  |      |
| Bike Lanes (Class I and II)  | 20   |
| Bike Lanes/sq mile   | 1.90 |
| % Increase in Bicycle Commute Mode Share for each Additional Mile of Bike Lane/sq mile | 1.0% |
| Mitigated Bicycle Commute Mode Share   | 1.0% |

### Measure T-3: Pedestrian Environment Enhancements

This measure quantifies reductions resulting from pedestrian enhancements based on the EPA's Smart Growth INDEX (SGI) model, and uses a variety of indicators to measure changes in the pedestrian environment, including: sidewalk availability, ease of street crossing, connectivity of street/sidewalk system, terrain, and the pedestrian environment factor. This measure assumes that 3% of intersections within the city are improved to facilitate greater pedestrian crossing and that additional sidewalks are added to improve pedestrian circulation options. Emissions reductions come from VMT differences between a BAU scenario and a mitigated scenario. The SGI model was used to help develop VMT reduction assumptions based on the proposed changes in the measure. Table B-12 shows the VMT reduction assumptions, and Table B-13 shows the VMT reduction calculations for this measure.

| Year        | Progress Indicators  | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|-------------|--|---|--|
| <b>2020</b> | Improve pedestrian infrastructure and conditions in 3% of streets in the community | 31 MT CO <sub>2</sub> e/yr              | <i>EPA Pedestrian Smart Growth INDEX model</i> |

| Table B-12<br>Application of Pedestrian Environment Factor Elasticities to VMT |            |            |
|--|------------|------------|
| Pedestrian Environment Factors (PEF)   | Baseline   | Mitigated  |
| Sidewalk Availability  | 1.0        | 2.0        |
| Ease of Street Crossing  | 1.0        | 2.5        |
| Connectivity of Street/Sidewalk System   | 1.0        | 1.0        |
| Terrain  | 1.0        | 1.0        |
| <b>PEF Score</b>   | <b>4.0</b> | <b>6.5</b> |
| Percent Change in PEF  | -          | 0.625      |
| Smart Growth INDEX PEF Elasticity  | -          | -0.03      |
| Percent Change in VMT  | -          | -0.01875   |
| Percent of Community Retrofitted   |            | 3%         |

Source: EPA Pedestrian Smart Growth INDEX model, adapted by AECOM, 2012

| <b>Table B-13</b>   |                          |                            |
|---|--------------------------|----------------------------|
| <b>Communitywide VMT Reductions – Pedestrian Environment Improvements</b> |                          |                            |
| <b>BAU Vehicles Miles Traveled Scenario</b>                               |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 85,673,144               | 4,485,505                  |
| Diesel  | 8,993,314                | 1,405,205                  |
| Total   | 94,666,458               | 5,890,710                  |
| <b>Mitigated Vehicles Miles Traveled Scenario</b>                         |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 84,066,773               | 4,401,402                  |
| Diesel  | 8,824,689                | 1,378,858                  |
| Total   | 92,891,462               | 5,780,259                  |
| <b>VMT and Fuel Reduction from Measure</b>                                |                          |                            |
|   | Community Travel (miles) | Fuel Consumption (gallons) |
| Gasoline  | 48,191                   | 2,523                      |
| Diesel  | 5,059                    | 790                        |
| <b>Total</b>  | <b>53,250</b>            | <b>3,314</b>               |

### Measure GI-1: Urban Forest

This measure is based on extrapolating the carbon potential of a typical tree planting palette. The City's goal is that 3,000 new trees will be planted by public and private development by 2020. Carbon sequestration rates specific to the species and age of the planted trees were collected from the Center for Urban Forest Research (CUFR) Tree Carbon Calculator and used to calculate the annual sequestration potential of the trees from 2008 – 2020. For purposes of the calculation it was assumed that an equal number of trees will be planted each year between 2008 and 2020 though the exact number of trees planted per year may vary. See Tables B-14 and B-15 for carbon sequestration assumptions used in this measure.

| Year        | Progress Indicators   | GHG Reduction (MT CO <sub>2</sub> e/yr) | Sources  |
|-------------|-----------------------|---|--|
| <b>2020</b> | Plant 3,000 new trees | 190 MT CO <sub>2</sub> e/yr             | The Center for Urban Forest Research (CUFR) Tree Carbon Calculator, Central Valley Climate Zone. |

**Table B-14**  
**Carbon Sequestration of Trees Planted 2012-2020 in 2020**

| Year                            | Trees Planted per Year | Years of Growth | GHG Emissions Reductions (lbs CO <sub>2</sub> e in 2020) | Carbon Sequestration (MT CO <sub>2</sub> e in 2020) |
|---------------------------------|------------------------|-----------------|--|---|
| 2012                            | 380                    | 0               | 116,516  | 52.9  |
| 2013                            | 380                    | 1               | 95,014   | 43.1  |
| 2014                            | 380                    | 2               | 74,910   | 34.0  |
| 2015                            | 380                    | 3               | 56,085   | 25.4  |
| 2016                            | 380                    | 4               | 40,567   | 18.4  |
| 2017                            | 380                    | 5               | 27,675   | 12.6  |
| 2018                            | 380                    | 6               | 16,877   | 7.7   |
| 2019                            | 380                    | 7               | 0  | 0.0   |
| <b>Cumulative Total in 2020</b> | <b>3,040</b>           | NA              | <b>427,644</b>   | <b>194.0</b>  |

Note: Assumes age of tree at planting = 4 years

**Table B-15**  
**Carbon Sequestration per Species per Year of growth**

| Species | Camphor Tree<br><i>Cinnamomum camphora</i> | Modesto Ash<br><i>Fraxinus vlutina</i> | Sweetgum<br><i>Liquidambar styraciflua</i> | Roble Negro<br><i>Quercus ilex</i> | Turkish Pine<br><i>Pinus brutia</i> | AVERAGE            |
|---------|--|--|--|------------------------------------|-------------------------------------|--------------------|
| Age     | per<br>year<br>20%                         | per<br>year<br>20%                     | per<br>year<br>20%                         | per<br>year<br>20%                 | per<br>year<br>20%                  | per<br>year<br>20% |
| 1       | 0.6 0.6                                    | 1.5 1.5                                | 0.2 0.2                                    | 0.0 0.0                            | 0.6 0.6                             | 0.3 0.6            |
| 2       | 0.6 1.2                                    | 13.7 15.2                              | 0.2 0.4                                    | 0.5 0.5                            | 0.6 1.2                             | 1.4 3.7            |
| 3       | 2.6 3.8                                    | 30.0 45.2                              | 0.2 0.6                                    | 3.1 3.6                            | 4.9 6.1                             | 3.7 11.9           |
| 4       | 6.0 9.8                                    | 43.7 88.9                              | 0.7 1.3                                    | 8.0 11.6                           | 12.3 18.4                           | 6.4 26.0           |
| 5       | 10.3 20.1                                  | 54.3 143.2                             | 1.7 3.0                                    | 14.3 25.9                          | 21.5 39.9                           | 9.3 46.4           |
| 6       | 13.1 33.2                                  | 58.6 201.8                             | 2.5 5.5                                    | 18.3 44.2                          | 27.5 67.4                           | 10.9 70.4          |
| 7       | 16.6 49.8                                  | 63.2 265.0                             | 3.7 9.2                                    | 23.5 67.7                          | 35.1 102.4                          | 12.9 98.8          |
| 8       | 21.2 71.0                                  | 68.2 333.2                             | 5.4 14.5                                   | 30.1 97.9                          | 44.8 147.2                          | 15.4 132.8         |
| 9       | 26.9 97.9                                  | 73.6 406.8                             | 7.9 22.4                                   | 38.6 136.5                         | 57.2 204.3                          | 18.6 173.6         |
| 10      | 34.2 132.1                                 | 79.4 486.2                             | 11.6 34.0                                  | 49.5 186.0                         | 73.0 277.3                          | 22.5 223.1         |
| 11      | 37.6 169.7                                 | 80.7 566.9                             | 13.7 47.7                                  | 54.2 240.2                         | 78.4 355.7                          | 24.0 276.0         |
| 12      | 41.3 211.0                                 | 81.9 648.8                             | 16.1 63.8                                  | 59.4 299.6                         | 84.1 439.9                          | 25.7 332.6         |

Source: Center for Urban Forest Research, CUFR Model, USDA, 2008

## Statewide Measures Reductions

For climate action planning purposes, baseline GHG emissions are projected under a business-as-usual scenario to a future year, assuming that conditions and consumption rates occurring in the baseline year would continue. However, even without local climate action planning, statewide measures and regulations would affect future business-as-usual GHG emissions.

Estimates of the local effect of statewide reduction measures should be conservative to avoid overestimating GHG reductions. In many cases, the regulation may not have the same effectiveness at a particular local level as it does on a statewide level. Furthermore, some regulations that affect certain industries or practices may occur more frequently in one jurisdiction than another and therefore various levels of statewide reductions would be anticipated in each jurisdiction. Therefore, AECOM has selected the following statewide reduction measures that would create reasonably foreseeable emissions reductions attributable to Shasta Lake at a local level.

## Renewable Portfolio Standard

Executive Order S-21-09 established a statewide renewable energy portfolio target of 33% by year 2020. Therefore, California utilities, including PG&E, will increase their renewable portfolio standard (RPS) to at least 33% by year 2020. The GHG reductions associated with the RPS were estimated by evaluating PG&E's RPS increase from baseline year 2008 to year 2020 and 2035. PG&E's year 2008 baseline RPS-eligible electricity sources were determined to be approximately 12%. However, PG&E also maintains other renewable electricity sources that don't qualify for RPS (e.g., large hydroelectric sources); however, would also not generate GHG emissions. These non-RPS eligible sources account for approximately 20% of PG&E's year 2008 baseline electricity portfolio. Therefore, the anticipated change from baseline year 2008 to year 2020 is a 21% increase in RPS sources (i.e.,  $33\% - 12\% = 21\%$ ). Assuming that PG&E will only focus on RPS-eligible sources, year 2020 renewable portfolio would be approximately 53% (i.e.,  $33\% \text{ RPS} + 20\% \text{ non-RPS} = 53\%$ ). Although it is likely that PG&E would add additional RPS and non-RPS sources between 2020 and 2035, or that new regulations would require an increase in RPS sources, for a conservative analysis, the projections assume the 33% RPS and 20% non-RPS eligible renewable sources remained constant between 2020 and 2035. Table B-16 presents calculations used to estimate GHG emission reductions associated with the RPS.

**Table B-16**  
**Communitywide Renewable Portfolio Standard Calculations**

| Parameter   | 2020   | 2035   |
|---|--------|--------|
| Total Business-As-Usual Electricity Emissions (MT CO <sub>2</sub> e/yr)   | 53,629 | 59,371 |
| Business-As-Usual RPS <sup>1</sup>  | 12%    | 12%    |
| Target RPS  | 33%    | 33%    |
| Additional RPS Percent Increase   | 21%    | 21%    |
| Total Renewable, Non-Carbon Electricity Sources   | 53%    | 53%    |
| Total Electricity Emissions with RPS Target (MT CO <sub>2</sub> e/yr)<br>(Electricity BAU × (1-Additional RPS)) | 37,067 | 41,036 |
| Emission Reduction (MT CO <sub>2</sub> e/yr)  | 16,562 | 18,335 |

Notes: MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalent per year; BAU = business as usual; RPS = renewable portfolio standard

<sup>1</sup> Business-as-usual renewable portfolio standard (RPS) (year 2008) and non-RPS eligible resources were obtained from Pacific Gas and Electric.

Source: AECOM 2012

## Scoping Plan Transportation Measures

The AB 32 Climate Change Scoping Plan (Scoping Plan) has established several statewide measures that will contribute to California achieving its GHG reduction goal. Several statewide measures would affect the transportation-related business-as-usual emissions. In order to account for GHG reductions associated with Pavley I and the Low Carbon Fuel Standard (LCFS), the ARB-approved Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0 was used to estimate reductions from EMFAC2007 outputs (ARB 2010b). Table B-17 presents GHG emission reductions associated with Pavley I and the LCFS transportation measures.

The AB 32 Scoping Plan includes other transportation measures that would reduce motor vehicle emissions on a statewide level, which are not estimated in any ARB-approved models. AECOM has selected Medium- and Heavy-Duty Vehicle Efficiency and Pavley II as measures that can be reasonably assumed to be implemented and affect transportation emissions within Shasta Lake. To estimate the local effect of these reductions, AECOM divided the anticipated transportation emission reductions associated with the Scoping Plan transportation measures by the ARB-projected 2020 transportation emissions to estimate the percent reduction in transportation emissions attributed to implementation of the Scoping Plan. The percent reduction achieved by these measures from the state's total transportation sector was applied to the City's business-as-usual transportation emissions. This method assumes that the City will achieve the same relative level of transportation emission reductions associated with transportation measures as the Scoping Plan assumes at the statewide level. Table B-18 presents calculations used to estimate GHG emission reductions associated with the Medium- and Heavy-Duty Vehicle Efficiency and Pavley II transportation measures.



**Table B-17**  
**Pavley I and Low Carbon Fuel Standard Emission Reductions**

| Transportation Measure   | Preferred Project<br>(MT CO <sub>2</sub> e/yr) |               |
|--------------------------|--|---------------|
|                          | 2020   | 2035          |
| Pavley I                 | 11,931   | 25,083        |
| Low Carbon Fuel Standard | 5,462  | 6,173         |
| <b>Total</b>             | <b>17,393</b>                                  | <b>31,256</b> |

Notes: MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalents per year.

Source: AECOM 2012, ARB 2010b

**Table B-18**  
**Communitywide Scoping Plan Measures Calculations**

| Energy Source and Year                                    | Statewide Total Emissions (MMT CO <sub>2</sub> e/yr) <sup>1</sup> | AB 32 Scoping Plan Reductions (MMT CO <sub>2</sub> e/yr) <sup>2</sup> | Percent Reduction | Shasta Lake Total Emissions (MT CO <sub>2</sub> e/yr) | Shasta Lake Total Emissions with Reduction Measure (MT CO <sub>2</sub> e/yr) | Emission Reductions (MT CO <sub>2</sub> e/yr) |
|---|---|---|-------------------|---|--|---|
| <b>Med- and Heavy-Duty Vehicle Efficiency<sup>3</sup></b> |   |   |                   |   |  |   |
| 2020  | 168.10  | 1.4   | 0.03%             | 56,608  | 56,269   | 339   |
| 2035 <sup>4</sup>   | 168.10  | 1.4   | 0.03%             | 78,196  | 77,707   | 489   |
| <b>Pavley II</b>  |   |   |                   |   |  |   |
| 2020  | 168.10  | 4.0   | 2.4%              | 56,608  | 55,000   | 1,608   |
| 2035 <sup>4</sup>   | 168.10  | 4.0   | 2.4%              | 78,196  | 76,242   | 1,954   |
| <b>Total Reductions</b>                                   |   |   |                   |   |  |   |
| 2020  | -   | -   | -                 | -   | -  | 19,340 <sup>5</sup>                           |
| 2035 <sup>4</sup>   | -   | -   | -                 | -   | -  | 33,699 <sup>5</sup>                           |

Notes: MMT CO<sub>2</sub>e/yr = million metric tons of carbon dioxide equivalent per year; MT CO<sub>2</sub>e/yr = metric tons of carbon dioxide equivalent per year.

<sup>1</sup> Obtained from the ARB's 2020 projected inventory.

<sup>2</sup> Obtained from ARB's updated AB 32 Scoping Plan implementation schedule.

<sup>3</sup> Combines two AB 32 Scoping Plan action items: Heavy-Duty Vehicle Aerodynamic Efficiency Program and Medium- and Heavy-Duty Vehicle Hybridization Program

<sup>4</sup> ARB has not projected California statewide emissions or emission reductions associated with the AB 32 Scoping Plan out to year 2035. It is anticipated that additional efficiency could increase the measures reductions; however, the same level of reductions was assumed for both 2020 and 2035.

<sup>5</sup> Total reductions equal the sum of emissions reductions from Pavley I and Low Carbon Fuel Standard (see Table B-18) and the transportation measures described and presented above.

Source: AECOM 2012, ARB 2010c, ARB 2011.

## 2008 and 2013 California Title-24 Standards

### *Impact of 2008 Title-24*

The first step of this analysis estimates the reduction in energy-related emissions (i.e., electricity and natural gas) associated with new buildings constructed from January 2010 through December 2013. This construction is subject to the current (2008) Title 24 energy code and therefore more efficient than buildings constructed under the 2005 Title 24 energy code requirements. Business-as-usual electricity and natural gas consumption levels for residential and non-residential construction were established using the CEC's Residential Appliance Saturation Survey data and the Commercial End Use Survey data for Forecast Climate Zone 3. The California Energy Commission's (CEC) report entitled *Impact Analysis - 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings* provides data on the energy savings potential of construction subject to 2008 requirements compared to construction subject to the 2005 baseline requirements. This savings potential was applied to projected levels of residential and non-residential construction for the jurisdiction (see Table B-19).

| Table B-19<br>Impact of 2008 T-24 on Building Energy Use |               |                  |
|--|---------------|------------------|
| Residential - Local Climate Zone                         |               |                  |
| Title-24 Period  | kWH/unit/year | therms/unit/year |
| T-24 2005 Residential (SFR) Energy Use                   | 7,514         | 364              |
| T-24 2008 Residential (SFR) Energy Use                   | 7,410         | 316              |
| % difference   | -1.4%         | -13.1%           |
| Non-Residential - Local Climate Zone                     |               |                  |
| Title-24 Period  | kWH/unit/year | kBTU/unit/year   |
| T-24 2005 Residential (SFR) Energy Use                   | 13.64         | 29.49            |
| T-24 2008 Residential (SFR) Energy Use                   | 13.04         | 25.45            |
| % difference   | -4.4%         | -13.7%           |

Note:

-Used RASS 'SFR' category for residential.

-Used CEUS 'All Commercial' category for non-residential.

### *Impact of 2013 Title-24*

The second step of this analysis estimates the reduction in energy-related emissions (i.e., electricity and natural gas) associated with new buildings constructed from January 2014 forward. The CAPCOA report "*Quantifying Greenhouse Gas Mitigation Measures*" provides a methodology for calculating the reduction in energy-related emissions (i.e., electricity and natural gas) resulting from new construction built to energy efficiency standards above the current (2008) Title 24 energy code. The methodology calculates the reduction in electricity and natural gas consumption for each percent increase over current Title 24 standards per residential and non-residential building type and climate zone.

Baseline electricity and natural gas consumption levels per residential unit type were identified using CEC's Residential Appliance Saturation Survey data for Forecast Climate Zone 3. Mitigated levels of electricity and natural gas consumption levels per building type were calculated using the CAPCOA methodology. The measure assumes that all new buildings constructed after January 2014 will exceed 2008 Title 24 energy standards by 25%. This assumption was based on the following CEC press release. [http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013\\_Building\\_Energy\\_Efficiency\\_Standards\\_FAQ.pdf](http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013_Building_Energy_Efficiency_Standards_FAQ.pdf)

***Building Construction Projections***

Projections of new residential development were developed from SCTPA traffic model inputs. Projections for new non-residential development were developed by using existing non-residential building area data from the County Assessors database and assuming the SCTPA traffic model employment growth rate to estimate growth in non-residential building stock.

# CITY OF REDDING



## GREENHOUSE GAS REDUCTION MEASURE QUANTIFICATION METHODOLOGY

The City of Redding's greenhouse gas reduction quantification methodology has not been prepared at this time and will be provided at a future date.

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## Appendix C –

# Target Setting Rationale



## TARGET SETTING RATIONALE

AECOM recommends that the Shasta region jurisdictions utilize the following greenhouse gas (GHG) reduction targets within their climate action plans to demonstrate the jurisdictions' commitment to California's climate protection efforts. The appendix describes (a) existing California climate change legislation and State guidance relevant to establishing GHG reductions target and (b) recommended communitywide operations GHG reduction targets.

### STATE LEGISLATION

The State of California has issued a variety of guidance relevant to the establishment of GHG reduction targets. The primary guidance relevant to local jurisdictions includes the following:

#### ***Executive Order S-3-05***

Executive Order (EO) S-3-05 states that California is vulnerable to the effects of climate change, including reduced snowpack in the Sierra Nevada Mountains, exacerbation of California's existing air quality problems, and sea level rise. To address these concerns, the executive order established statewide targets to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80% below 1990 levels by 2050.

#### ***Assembly Bill 32 and Climate Change Scoping Plan***

Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directs ARB to develop and implement regulations that reduce statewide GHG emissions. The Climate Change Scoping Plan (Scoping Plan) was approved by ARB in December 2008 and outlines the State's plan to achieve the GHG reductions required in AB 32. The Scoping Plan contains the primary strategies California will implement to achieve a reduction of 169 million metric tons of carbon dioxide equivalent, or approximately 28% from the State's projected 2020 emission levels.

In the Scoping Plan, ARB encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the State commitment to reduce GHGs. The Plan identifies California's cities and counties as "essential partners" within the overall statewide effort and recommends that local governments set a GHG reduction target of 15 percent below 2008-2008 levels by the year 2020.

#### ***Senate Bill 375***

Additionally, Senate Bill (SB) 375 (2008) established a process whereby regional targets for reduced passenger vehicle and light duty truck GHG emissions have been established for each Metropolitan Planning Organization (MPO) in the state, including the Shasta region. The Air Resources Board adopted targets for the Shasta region are zero percent per capita growth in 2020 and 2035. It should be noted that this is a regional target and not necessarily a target for each member jurisdiction.

#### ***Senate Bill 97***

Senate Bill (SB) 97 acknowledges that climate change is a prominent environmental issue that requires analysis under the California Environmental Quality Act (CEQA). Pursuant to SB 97, the State CEQA Guidelines were updated in 2010 to include provisions for mitigating GHG emissions and/or the effects of GHG emissions. The amended CEQA Guidelines (Section 15183.5) allow jurisdictions to analyze and mitigate the significant effects of GHGs at a programmatic level by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impacts analysis. If a plan is to be used for tiering or incorporation by reference purposes, it should contain enforceable reduction measures and demonstrate that it can reliably reduce the community's

GHG emissions to a degree that contributes its fair share to State emissions reduction efforts (see Attorney General's guidance below).

### ***Attorney General Guidance***

In March 2009 correspondence to local governments, the State Attorney General's Office emphasized and expanded upon this recommendation by stating that communitywide targets should align with an emissions trajectory that reflects aggressive GHG mitigation in the near term, and California's interim (1990 levels by 2020) and long-term (80 percent below 1990 levels by 2050) GHG emissions limits set forth in AB 32 and Executive Order S-3-05.

The Attorney General's August 31<sup>st</sup> 2009 letter to San Diego County states that GHG projections associated with a General Plan update should estimate the emission levels through the full planning horizon not just in 2020. Though the letter only explicitly calls for projections, it could be assumed that an emission reduction target would also be required.

### ***Summary of State Guidance on Local Government Targets***

Table C-1 provides a summary of the State of California's guidance to local governments regarding GHG reduction targets. This guidance applies to both local government operations and communitywide emissions reductions efforts.

**Table C-1: Summary of State Guidance on Local Government Targets**

| <b>Target Year</b>                    | <b>2020</b>                | <b>Interim Year Between 2020-2050</b>  | <b>2050</b>   |
|---------------------------------------|----------------------------|--|---|
| AB 32 Scoping Plan Recommended Target | 15% below 2005-2008 levels | NA   | NA  |
| Attorney General's Office Guidance    | 15% below 2005-2008 levels | Demonstrate a trajectory toward 2050 levels (e.g., 49% below 2005-2008 levels by 2035) | 80% below 1990 levels or 83% below 2005-2008 levels |

## **RECOMMENDED GHG TARGETS FOR SHASTA COUNTY JURISDICTIONS**

To conform to the 2020-2035 GHG reduction targets of the Attorney General, AECOM recommends that Shasta County jurisdictions adopt the following 2020 and 2035 GHG reduction targets. Because 2008 serves as the year of the baseline inventory, the reduction targets are expressed as percent reductions below 2008 levels (see Tables C-2, C-3, C-4, and C-5 for a comparison of 2008 and 1990 baseline targets for each jurisdiction). These tables simply illustrate the magnitude of reductions that would be required to meet the Attorney General's Guidance shown in Table C-1.

### ***2020 Target: 15 Percent below 2008 Levels***

Selecting a reduction target that calls for GHG emissions to be 15 percent below 2008 levels by 2020 offers the following benefits:

- ▶ Consistent with current guidance offered by ARB and the California Attorney General's Office
- ▶ Demonstrates contribution to State AB 32 GHG emissions reduction goals for 2020

### ***2035 Target: 49 Percent below 2008 Levels***

A target that strives to reduce GHG emissions to be 49 percent below 2008 levels by 2035 provides the following benefits:

- ▶ Consistent with the guidance offered by the California Attorney General's Office
- ▶ Demonstrates a trajectory toward the State's long-term (EO-S-3-05) emissions reduction goals
- ▶ Aligns with SB-375 planning horizon

**Table C-2: Comparison of 1990 and 2008 Based Targets - Unincorporated Shasta County**

| <b>2008 Emissions Level<br/>From Inventory</b> | <b><u>Estimated</u><br/>1990 Emissions Target Level<br/>(15% below 2008)</b> |
|--|--|
| 571,255  | 485,567  |

| <b>Target<br/>Year</b> | <b>Target<br/>Emissions<br/>Level</b> | <b>Percent Below<br/>1990 Emission<br/>Levels</b> | <b>Percent Below<br/>2008 Emission<br/>Levels</b> |
|------------------------|---------------------------------------|---|---|
| 2020                   | 485,567                               | 0.00%   | 15.0%   |
| 2021                   | 472,457                               | 2.70%   | 17.3%   |
| 2022                   | 459,832                               | 5.30%   | 19.5%   |
| 2023                   | 446,722                               | 8.00%   | 21.8%   |
| 2024                   | 433,611                               | 10.70%  | 24.1%   |
| 2025                   | 420,987                               | 13.30%  | 26.3%   |
| 2026                   | 407,876                               | 16.00%  | 28.6%   |
| 2027                   | 394,766                               | 18.70%  | 30.9%   |
| 2028                   | 382,141                               | 21.30%  | 33.1%   |
| 2029                   | 369,031                               | 24.00%  | 35.4%   |
| 2030                   | 355,921                               | 26.70%  | 37.7%   |
| 2031                   | 343,296                               | 29.30%  | 39.9%   |
| 2032                   | 330,186                               | 32.00%  | 42.2%   |
| 2033                   | 317,075                               | 34.70%  | 44.5%   |
| 2034                   | 304,451                               | 37.30%  | 46.7%   |
| 2035                   | 291,340                               | 40.00%  | 49.0%   |
| 2036                   | 278,230                               | 42.70%  | 51.3%   |
| 2037                   | 265,605                               | 45.30%  | 53.5%   |
| 2038                   | 252,495                               | 48.00%  | 55.8%   |
| 2039                   | 239,385                               | 50.70%  | 58.1%   |
| 2040                   | 226,760                               | 53.30%  | 60.3%   |
| 2041                   | 213,649                               | 56.00%  | 62.6%   |
| 2042                   | 200,539                               | 58.70%  | 64.9%   |
| 2043                   | 187,914                               | 61.30%  | 67.1%   |
| 2044                   | 174,804                               | 64.00%  | 69.4%   |
| 2045                   | 161,694                               | 66.70%  | 71.7%   |
| 2046                   | 149,069                               | 69.30%  | 73.9%   |
| 2047                   | 135,959                               | 72.00%  | 76.2%   |
| 2048                   | 122,848                               | 74.70%  | 78.5%   |
| 2049                   | 110,224                               | 77.30%  | 80.7%   |
| 2050                   | 97,113                                | 80.00%  | 83.0%   |

| <b>2008 Emissions Level<br/>From Inventory</b> | <b><u>Estimated</u><br/>1990 Emissions Target Level<br/>(15% below 2008)</b> |
|--|--|
| 88,625   | 75,331   |

**Table C-3: Comparison of 1990 and 2008 Based Targets - City of Anderson**

| <b>Target Year</b> | <b>Target Emissions Level</b> | <b>Percent Below 1990 Emission Levels</b> | <b>Percent Below 2008 Emission Levels</b> |
|--------------------|-------------------------------|---|---|
| 2020               | 75,331                        | 0.00%                                     | 15.0%                                     |
| 2021               | 73,297                        | 2.70%                                     | 17.3%                                     |
| 2022               | 71,339                        | 5.30%                                     | 19.5%                                     |
| 2023               | 69,305                        | 8.00%                                     | 21.8%                                     |
| 2024               | 67,271                        | 10.70%                                    | 24.1%                                     |
| 2025               | 65,312                        | 13.30%                                    | 26.3%                                     |
| 2026               | 63,278                        | 16.00%                                    | 28.6%                                     |
| 2027               | 61,244                        | 18.70%                                    | 30.9%                                     |
| 2028               | 59,286                        | 21.30%                                    | 33.1%                                     |
| 2029               | 57,252                        | 24.00%                                    | 35.4%                                     |
| 2030               | 55,218                        | 26.70%                                    | 37.7%                                     |
| 2031               | 53,259                        | 29.30%                                    | 39.9%                                     |
| 2032               | 51,225                        | 32.00%                                    | 42.2%                                     |
| 2033               | 49,191                        | 34.70%                                    | 44.5%                                     |
| 2034               | 47,233                        | 37.30%                                    | 46.7%                                     |
| 2035               | 45,199                        | 40.00%                                    | 49.0%                                     |
| 2036               | 43,165                        | 42.70%                                    | 51.3%                                     |
| 2037               | 41,206                        | 45.30%                                    | 53.5%                                     |
| 2038               | 39,172                        | 48.00%                                    | 55.8%                                     |
| 2039               | 37,138                        | 50.70%                                    | 58.1%                                     |
| 2040               | 35,180                        | 53.30%                                    | 60.3%                                     |
| 2041               | 33,146                        | 56.00%                                    | 62.6%                                     |
| 2042               | 31,112                        | 58.70%                                    | 64.9%                                     |
| 2043               | 29,153                        | 61.30%                                    | 67.1%                                     |
| 2044               | 27,119                        | 64.00%                                    | 69.4%                                     |
| 2045               | 25,085                        | 66.70%                                    | 71.7%                                     |
| 2046               | 23,127                        | 69.30%                                    | 73.9%                                     |
| 2047               | 21,093                        | 72.00%                                    | 76.2%                                     |
| 2048               | 19,059                        | 74.70%                                    | 78.5%                                     |
| 2049               | 17,100                        | 77.30%                                    | 80.7%                                     |
| 2050               | 15,066                        | 80.00%                                    | 83.0%                                     |

**Table C-4: Comparison of 1990 and 2008 Based Targets - City of Shasta Lake**

| <b>2008 Emissions Level From Inventory</b> | <b><u>Estimated</u><br/>1990 Emissions Target Level<br/>(15% below 2008)</b> |
|--|--|
| 571,255                                    | 485,567  |

| <b>Target Year</b> | <b>Target Emissions Level</b> | <b>Percent Below 1990 Emission Levels</b> | <b>Percent Below 2008 Emission Levels</b> |
|--------------------|-------------------------------|---|---|
| 2020               | 122,358                       | 0.00%                                     | 15.0%                                     |
| 2021               | 119,054                       | 2.70%                                     | 17.3%                                     |
| 2022               | 115,873                       | 5.30%                                     | 19.5%                                     |
| 2023               | 112,569                       | 8.00%                                     | 21.8%                                     |
| 2024               | 109,265                       | 10.70%                                    | 24.1%                                     |
| 2025               | 106,084                       | 13.30%                                    | 26.3%                                     |
| 2026               | 102,780                       | 16.00%                                    | 28.6%                                     |
| 2027               | 99,477                        | 18.70%                                    | 30.9%                                     |
| 2028               | 96,296                        | 21.30%                                    | 33.1%                                     |
| 2029               | 92,992                        | 24.00%                                    | 35.4%                                     |
| 2030               | 89,688                        | 26.70%                                    | 37.7%                                     |
| 2031               | 86,507                        | 29.30%                                    | 39.9%                                     |
| 2032               | 83,203                        | 32.00%                                    | 42.2%                                     |
| 2033               | 79,900                        | 34.70%                                    | 44.5%                                     |
| 2034               | 76,718                        | 37.30%                                    | 46.7%                                     |
| 2035               | 73,415                        | 40.00%                                    | 49.0%                                     |
| 2036               | 70,111                        | 42.70%                                    | 51.3%                                     |
| 2037               | 66,930                        | 45.30%                                    | 53.5%                                     |
| 2038               | 63,626                        | 48.00%                                    | 55.8%                                     |
| 2039               | 60,322                        | 50.70%                                    | 58.1%                                     |
| 2040               | 57,141                        | 53.30%                                    | 60.3%                                     |
| 2041               | 53,837                        | 56.00%                                    | 62.6%                                     |
| 2042               | 50,534                        | 58.70%                                    | 64.9%                                     |
| 2043               | 47,352                        | 61.30%                                    | 67.1%                                     |
| 2044               | 44,049                        | 64.00%                                    | 69.4%                                     |
| 2045               | 40,745                        | 66.70%                                    | 71.7%                                     |
| 2046               | 37,564                        | 69.30%                                    | 73.9%                                     |
| 2047               | 34,260                        | 72.00%                                    | 76.2%                                     |
| 2048               | 30,957                        | 74.70%                                    | 78.5%                                     |
| 2049               | 27,775                        | 77.30%                                    | 80.7%                                     |
| 2050               | 24,472                        | 80.00%                                    | 83.0%                                     |

**Table C-5: Comparison of 1990 and 2008 Based Targets - City of Redding**

| <b>2008 Emissions Level From Inventory</b> | <b><u>Estimated</u><br/>1990 Emissions Target Level<br/>(15% below 2008)</b> |
|--|--|
| 958,570                                    | 814,784  |

| <b>Target Year</b> | <b>Target Emissions Level</b> | <b>Percent Below 1990 Emission Levels</b> | <b>Percent Below 2008 Emission Levels</b> |
|--------------------|-------------------------------|---|---|
| 2020               | 814,784                       | 0.00%                                     | 15.0%                                     |
| 2021               | 792,785                       | 2.70%                                     | 17.3%                                     |
| 2022               | 771,601                       | 5.30%                                     | 19.5%                                     |
| 2023               | 749,601                       | 8.00%                                     | 21.8%                                     |
| 2024               | 727,602                       | 10.70%                                    | 24.1%                                     |
| 2025               | 706,418                       | 13.30%                                    | 26.3%                                     |
| 2026               | 684,419                       | 16.00%                                    | 28.6%                                     |
| 2027               | 662,419                       | 18.70%                                    | 30.9%                                     |
| 2028               | 641,235                       | 21.30%                                    | 33.1%                                     |
| 2029               | 619,236                       | 24.00%                                    | 35.4%                                     |
| 2030               | 597,237                       | 26.70%                                    | 37.7%                                     |
| 2031               | 576,052                       | 29.30%                                    | 39.9%                                     |
| 2032               | 554,053                       | 32.00%                                    | 42.2%                                     |
| 2033               | 532,054                       | 34.70%                                    | 44.5%                                     |
| 2034               | 510,870                       | 37.30%                                    | 46.7%                                     |
| 2035               | 488,870                       | 40.00%                                    | 49.0%                                     |
| 2036               | 466,871                       | 42.70%                                    | 51.3%                                     |
| 2037               | 445,687                       | 45.30%                                    | 53.5%                                     |
| 2038               | 423,688                       | 48.00%                                    | 55.8%                                     |
| 2039               | 401,689                       | 50.70%                                    | 58.1%                                     |
| 2040               | 380,504                       | 53.30%                                    | 60.3%                                     |
| 2041               | 358,505                       | 56.00%                                    | 62.6%                                     |
| 2042               | 336,506                       | 58.70%                                    | 64.9%                                     |
| 2043               | 315,321                       | 61.30%                                    | 67.1%                                     |
| 2044               | 293,322                       | 64.00%                                    | 69.4%                                     |
| 2045               | 271,323                       | 66.70%                                    | 71.7%                                     |
| 2046               | 250,139                       | 69.30%                                    | 73.9%                                     |
| 2047               | 228,140                       | 72.00%                                    | 76.2%                                     |
| 2048               | 206,140                       | 74.70%                                    | 78.5%                                     |
| 2049               | 184,956                       | 77.30%                                    | 80.7%                                     |
| 2050               | 162,957                       | 80.00%                                    | 83.0%                                     |

# Appendix D –

## Economic Analysis

| Shasta County - Estimated Cost to Jurisdiction of CAP Measure Implementation 2012-2020 |                             |   |  |                    |                   |                    |                      |                   |                      |             |   |                    |                                 |   |
|--|-----------------------------|---|--|--------------------|-------------------|--------------------|----------------------|-------------------|----------------------|-------------|---|--------------------|---------------------------------|---|
| Energy   |                             |   |  |                    |                   |                    |                      |                   |                      |             |   |                    |                                 |   |
| Energy Efficiency  |                             |   | Actions  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions   | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| BE-1   | Existing Buildings          | A | Continue to promote PG&E incentives and energy conservation programs for older homes.  | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: NA  | 10,600             | 201                             | 53  |
|  |                             | B | Develop comprehensive public outreach campaign promoting energy-efficiency improvements.   | 312                | 12,000            | 0                  | 15,000               | 25%               | 74,250               | 10,600      | Annual Labor: Assume one staff time at 15% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k in outreach campaign costs (e.g. website, pamphlets, posters)  |                    |                                 |   |
| BE-2   | New Commercial              | A | Develop a priority permitting program for new residential projects that demonstrate 15% higher efficiency than Title 24 requirements.  | 52                 | 2,000             | 0                  | 18,000               | 0%                | 32,000               | 4,600       | Annual Labor: Assume one staff time at 2.5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$18k developing priority permitting program (e.g., consulting fees, BOS hearing)   | 56,652             | 0                               | NA  |
| BE-3   | Commercial Indoor Lighting  | A | Discuss applicable rebates and incentive programs with building developers during the building permit phase  | 104                | 4,000             | 0                  | 10,000               | 0%                | 38,000               | 5,400       | Annual Labor: Assume one staff time at 5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)   | 9,400              | 24                              | 392   |
|  |                             | B | Provided targeted outreach to building owners/managers of large non-residential buildings  | 104                | 4,000             | 0                  | 0                    | 0%                | 28,000               | 4,000       | Annual Labor: Assume one staff time at 5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
| BE-4   | Energy-Efficient Appliances | A | Collaborate with PG&E to promote existing financial incentives programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances   | 52                 | 2,000             | 0                  | 10,000               | 25%               | 18,000               | 2,600       | Annual Labor: Assume one staff time at 2.5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)   | 11,600             | 1,443                           | 8   |
|  |                             | B | Advertise energy-efficient appliance rebates at community events   | 52                 | 2,000             | 10,000             | 0                    | 25%               | 63,000               | 9,000       | Annual Labor: Assumes one staff time at 2.5% FTE per year<br>Annual Direct: Assumes \$10k for community events costs per year (e.g., event fees, posters, handouts)<br>One-Time Direct: NA  |                    |                                 |   |
| BE-5   | Smart Grid Integration      | A | Develop an outreach program with PG&E that informs property owners and businesses about smart grid and smart appliance technologies, as well as energy conservation opportunities using smart meter technology | 104                | 4,000             | 0                  | 10,000               | 25%               | 28,500               | 4,100       | Annual Labor: Assumes one staff time at 5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)  | 46,704             | 1,214                           | 38  |
| Renewable Energy   |                             |   | Actions  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions   | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| BE-6   | Solar Water Heaters         | A | Work with PG&E and California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential and commercial buildings                                      | 130                | 5,000             | 0                  | 12,000               | 25%               | 35,250               | 5,000       | Annual Labor: Assumes one staff time at 6.3% FTE per year for overseeing outreach program<br>Annual Direct: NA<br>One-Time Direct: Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)  | 11,100             | 886                             | 13  |
|  |                             | B | Encourage the use of California Solar Initiative, US EPA, PG&E, and other rebates for solar hot water heaters  | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes costs covered by BE-6 Action A<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
|  |                             | C | Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation   | 52                 | 2,000             | 0                  | 7,500                | 0%                | 21,500               | 3,100       | Annual Labor: Assume one staff time at 2.5% FTE per year for additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes \$7.5k developing priority permitting program (e.g., consulting fees, BOS hearing) - Note Split cost with BE-6 Action B |                    |                                 |   |
|  |                             | D | Remove fees associated with installation of solar water heaters  | 78                 | 3,000             | 0                  | 0                    | 0%                | 21,000               | 3,000       | Annual Labor: Assume one staff time at 3.8% FTE per year<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
| BE-7   | Solar PV Systems            | A | Remove regulatory barriers to installation of PV systems   | 0                  | 0                 | 0                  | 20,000               | 0%                | 20,000               | 2,900       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$20k developing priority permitting program (e.g., consulting fees, BOS hearing)   | 12,000             | 6,315                           | 2   |
|  |                             | B | Provide streamlined permitting and waive permitting fees related to installation of PV systems   | 78                 | 3,000             | 0                  | 7,500                | 0%                | 28,500               | 4,100       | Annual Labor: Assume one staff time at 3.8% FTE per year for additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes 7.5k developing priority permitting program (e.g., consulting fees, BOS hearing) - Note Split cost with BE-6 Action C   |                    |                                 |   |
|  |                             | C | Develop public outreach campaign that explains benefits of PV systems, highlights available rebates/incentives, explains PPAs and identifies solar service providers in the area                               | 130                | 5,000             | 0                  | 12,000               | 25%               | 35,250               | 5,000       | Annual Labor: Assume one staff time at 6.3% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)   |                    |                                 |   |
| Subtotal   |                             |   |  | 1,248              | 48,000            | 10,000             | 122,000              | NA                | 443,250              | 63,400      |   |                    |                                 |   |



| Solid Waste             |      |   | Actions | Annual Labor Hours   | Annual Labor Cost  | Annual Direct Cost | One Time Direct Cost | % External Funded    | Total 2012-2020 Cost | Annual Cost          | Assumptions | Total Measure Cost  | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |   |
|-------------------------|------|---|---------|--|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|-------------|---|---------------------------------|---|---|
|                         | SW-1 | Lumber Waste Diversion                    | A       | Adopt 75% lumber diversion ordinance applicable to residential and commercial construction and renovation projects   | 104                | 4,000              | 0                    | 15,000               | 0%                   | 43,000               | 6,100       | Annual Labor: Assume one staff time at 5% FTE per year (e.g., site enforcement)<br>Annual Direct: NA<br>One-Time Direct: Assumes 15k developing ordinance (e.g., consulting fees, BOS hearing)  | 6,100                           | 1,334   | 5   |
|                         | SW-2 | Methane Recovery                          | A       | Complete installation of methane capture facilities at West Central Landfill   | 0                  | 0                  | 0                    | 0                    | 0%                   | 0                    | 0           | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: No future cost estimated as already implemented   | 1,900                           | 16,360  | NA  |
|                         |      |   | B       | Evaluate future proposals for construction of landfill energy-to-gas system at West Central Landfill   | 0                  | 0                  | 0                    | 18,000               | 25%                  | 13,500               | 1,900       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes 18k for evaluation of proposals (e.g., staff and consulting fees, BOS hearing)  |                                 |   |   |
| Subtotal                |      |   |         |  | 104                | 4,000              | 0                    | 33,000               | NA                   | 56,500               | 8,000       |   |                                 |   |   |
| Water                   |      |   | Actions | Annual Labor Hours   | Annual Labor Cost  | Annual Direct Cost | One Time Direct Cost | % External Funded    | Total 2012-2020 Cost | Annual Cost          | Assumptions | Total Measure Cost  | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |   |
|                         | W-1  | Residential Fixture and Fittings Retrofit | A       | Develop informational materials that describe benefits of installing high-efficiency water fixtures/appliances   | 52                 | 2,000              | 0                    | 10,000               | 25%                  | 18,000               | 2,600       | Annual Labor: Assumes one staff time at 2.5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)  | 3,600                           | 94  | 38  |
|                         |      |   | B       | Identify water efficiency rebates or incentives applicable to unincorporated Shasta County residents   | 26                 | 1,000              | 0                    | 0                    | 0%                   | 7,000                | 1,000       | Annual Labor: Assumes one staff time at 1.25% FTE per year<br>Annual Direct: NA<br>One-Time Direct: NA  |                                 |   |   |
| Subtotal                |      |   |         |  | 78                 | 3,000              | 0                    | 10,000               | NA                   | 25,000               | 3,600       |   |                                 |   |   |
| Transportation          |      |   | Actions | Annual Labor Hours   | Annual Labor Cost  | Annual Direct Cost | One Time Direct Cost | % External Funded    | Total 2012-2020 Cost | Annual Cost          | Assumptions | Total Measure Cost  | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |   |
|                         | T-1  | Bicycle Lane Expansion                    | A       | Pursue funding to implement Bicycle Transportation Plan; construct proposed bicycle paths  | 416                | 16,000             | 68,800               | 2,092,380            | 50%                  | 1,342,990            | 191,900     | Annual Labor: Assumes one staff time at 20% FTE per year to oversee implementation<br>Annual Direct: Assumes average of \$1600/mile maintenance cost for bike path/lanes and 43 miles of new bike path by 2020.<br>One-Time Direct: Assumes 43 miles of new bike infrastructure by 2020 and 20% of the new infrastructure will be class 1 bike path with a \$214,100/mile construction cost and 80% of the new infrastructure will be class 2 bike lanes (requiring striping and signs) with a \$7,300/mile construction cost | 194,100                         | 127   | 1,526   |
|                         |      |   | B       | Discuss benefits of providing end-of-trip facilities at large employment centers with project developers   | 39                 | 1,500              | 0                    | 5,000                | 0%                   | 15,500               | 2,200       | Annual Labor: Assumes one staff time at 1.9% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$5k in outreach materials (e.g. website, pamphlets)   |                                 |   |   |
|                         | T-2  | Commute Trip Reduction                    | A       | Develop a ride-matching website  | 104                | 4,000              | 4,800                | 20,000               | 25%                  | 61,200               | 8,700       | Annual Labor: Assumes one staff time at 5% FTE per year to oversee ride match program<br>Annual Direct:Assumes \$400/month management fee for rideshare website and software.<br>One-Time Direct: Assumes \$20k purchase costs for rideshare software   | 15,400                          | 70  | 220   |
|                         |      |   | B       | Identify transit stops in high-activity areas that would benefit from additional enhancements (e.g., shelter, seating, electronic arrival/departure information) | 0                  | 0                  | 0                    | 25,000               | 25%                  | 18,750               | 2,700       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes 25k for transit stop study (e.g., consulting fees)  |                                 |   |   |
|                         |      |   | C       | Pursue funding for transit stop improvements   | 104                | 4,000              | 0                    | 0                    | 0%                   | 28,000               | 4,000       | Annual Labor: Assumes one staff time at 5% FTE per year to pursue grants<br>Annual Direct: NA<br>One-Time Direct: NA  |                                 |   |   |
| Subtotal                |      |   |         |  | 663                | 25,500             | 73,600               | 2,142,380            | NA                   | 1,466,440            | 209,500     |   |                                 |   |   |
| Green Infrastructure    |      |   | Actions | Annual Labor Hours   | Annual Labor Cost  | Annual Direct Cost | One Time Direct Cost | % External Funded    | Total 2012-2020 Cost | Annual Cost          | Assumptions | Total Measure Cost  | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |   |
|                         | GI-1 | Enhance Urban Forest                      | A       | Work with PG&E to advertise the benefits of planting shade trees around buildings and parking lots   | 52                 | 2,000              | 0                    | 10,000               | 25%                  | 18,000               | 2,600       | Annual Labor: Assumes one staff time at 5% FTE per year to pursue grants<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)   | 32,652                          | 30  | 1,088   |
| Subtotal                |      |   |         |  | 52                 | 2,000              | 0                    | 10,000               | NA                   | 18,000               | 2,600       |   |                                 |   |   |
| TOTAL COSTS 2012 - 2020 |      |   |         |  | Annual Labor Hours | Annual Labor Cost  | Annual Direct Cost   | One Time Direct Cost | % External Funded    | Total 2012-2020 Cost | Annual Cost |   | Total Measure Cost              | Measure GHG Reduction Potential                               | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| Cost                    |      |   |         |  | 2,145              | 82,500             | 83,600               | 2,317,380            | NA                   | 2,009,190            | 287,100     |   |                                 |   |   |
| Additional FTE Staff    |      |   |         |  | 1.03               |                    |                      |                      |                      |                      |             |   |                                 |   |   |

Other Assumptions

|                                      |           |
|--------------------------------------|-----------|
| Years of Implementation (2020-2013)  | 7         |
| County Staff FTE Salary and Benefits | \$ 80,000 |
| FTE Hours per Year                   | 2,080     |

NOTE: This analysis is only an estimate of measure implementation cost. The County and cities will work to foster partnerships and obtain grants to carry out these measures in a cost-effective manner.

| City of Anderson - Estimated Cost to Jurisdiction of CAP Measure Implementation 2012-2020 |                        |   |   |                    |                   |                    |                      |                   |                      |             |   |                    |                                 |   |
|---|------------------------|---|---|--------------------|-------------------|--------------------|----------------------|-------------------|----------------------|-------------|---|--------------------|---------------------------------|---|
| Energy  |                        |   |   |                    |                   |                    |                      |                   |                      |             |   |                    |                                 |   |
| Energy Efficiency   |                        |   | Actions   | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions   | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| BE-1  | Existing Buildings     | A | Partner with PG&E to promote and improve utility incentives for energy conservation programs for older homes and renovations.   | 52                 | 2,000             | 0                  | 10,000               | 0%                | 24,000               | 3,400       | Annual Labor: Assume one staff time at 2.5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)                                   | 9,700              | 127                             | 77  |
|   |                        | B | Facilitate the use of energy efficient demonstration homes as an education and promotion tool.  | 52                 | 2,000             | 0                  | 5,000                | 0%                | 19,000               | 2,700       | Annual Labor: Assume one staff time at 2.5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$5k in outreach campaign costs (e.g. website, pamphlets, posters)                                    |                    |                                 |   |
|   |                        | C | Consider development of a Property Assessed Clean Energy (PACE) program.  | 39                 | 1,500             | 0                  | 15,000               | 0%                | 25,500               | 3,600       | Annual Labor: Assume one staff time at 1.9% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k developing PACE program (e.g., consulting fees, council hearing)                                |                    |                                 |   |
| BE-2  | New Construction       | A | Partner with PG&E to promote and provide utility incentives for energy efficiency programs in new construction.   | 26                 | 1,000             | 0                  | 0                    | 0%                | 7,000                | 1,000       | Annual Labor: Assume one staff time at 1.3% FTE per year<br>Annual Direct: NA<br>One-Time Direct: NA  | 4,100              | 0                               | NA  |
|   |                        | B | Develop a priority permitting program for new construction projects that demonstrate 15% higher efficiency than Title 24 requirements.  | 26                 | 1,000             | 0                  | 15,000               | 0%                | 22,000               | 3,100       | Annual Labor: Assume one staff time at 1.3% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k developing priority permitting program (e.g., consulting fees, council hearing)                 |                    |                                 |   |
| BE-3  | Commercial Lighting    | A | Partner with PG&E to promote and provide utility incentives for commercial interior lighting retrofits.   | 52                 | 2,000             | 0                  | 10,000               | 0%                | 24,000               | 3,400       | Annual Labor: Assume one staff time at 2.5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)                                   | 8,500              | 183                             | 46  |
|   |                        | B | Discuss applicable rebates and incentive programs with building developers during the building permit phase   | 26                 | 1,000             | 0                  | 10,000               | 0%                | 17,000               | 2,400       | Annual Labor: Assume one staff time at 1.3% FTE per year for additional counter time<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
|   |                        | C | Provided targeted outreach to building owners/managers of large non-residential buildings   | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes cost covered by Action BE-3 A<br>Annual Direct: NA<br>One-Time Direct: NA   |                    |                                 |   |
|   |                        | D | Develop a parking lot and public area lighting-specific outreach program.   | 26                 | 1,000             | 0                  | 12,000               | 0%                | 19,000               | 2,700       | Annual Labor: Assume one staff time at 1.3% FTE per year<br>Annual Direct: NA<br>One-Time Direct:Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)                                    |                    |                                 |   |
| BE-4  | Efficient Appliances   | A | Collaborate with PG&E to promote existing financial incentives programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances                                  | 26                 | 1,000             | 0                  | 10,000               | 25%               | 12,750               | 1,800       | Annual Labor: Assume one staff time at 1.3% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)                                   | 10,800             | 229                             | 47  |
|   |                        | B | Advertise energy-efficient appliance rebates at community events  | 52                 | 2,000             | 10,000             | 0                    | 25%               | 63,000               | 9,000       | Annual Labor: Assumes one staff time at 2.5% FTE per year<br>Annual Direct: Assumes \$10k for community events costs per year (e.g., event fees, posters, handouts)<br>One-Time Direct: NA                      |                    |                                 |   |
| BE-5  | Smart Grid Integration | A | Develop an outreach program that informs property owners and businesses about smart grid and smart appliance technologies, as well as energy conservation opportunities using smart meter technology. | 39                 | 1,500             | 0                  | 10,000               | 25%               | 15,375               | 2,200       | Annual Labor: Assumes one staff time at 1.9% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)                                  | 29,114             | 711                             | 41  |
| Renewable Energy  |                        |   | Actions   | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions   | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| BE-6  | Solar Water Heaters    | A | Work with PG&E and California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential and commercial buildings.                            | 52                 | 2,000             | 0                  | 10,000               | 25%               | 18,000               | 2,600       | Annual Labor: Assumes one staff time at 2.5% FTE per year for overseeing outreach program<br>Annual Direct: NA<br>One-Time Direct: Assumes \$7.5k in outreach campaign costs (e.g. website, pamphlets, posters) | 5,700              | 56                              | 101   |
|   |                        | B | Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation.   | 0                  | 0                 | 0                  | 15,000               | 0%                | 15,000               | 2,100       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k developing streamlined permitting program (e.g., consulting fees, Council hearing)  |                    |                                 |   |
|   |                        | C | Encourage the use of California Solar Initiative, US EPA, PG&E, and other rebates for solar hot water heaters.  | 26                 | 1,000             | 0                  | 0                    | 0%                | 7,000                | 1,000       | Annual Labor: Assume one staff time at 1.3% FTE per year for additional counter time<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
| Subtotal  |                        |   |   | 494                | 19,000            | 10,000             | 122,000              | NA                | 288,625              | 41,000      |   |                    |                                 |   |

| Solid Waste    |      |                                     | Actions   | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions  | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness<br>(Annual Cost/<br>Annual MT CO <sub>2</sub> e) |
|----------------|------|-------------------------------------|---|--------------------|-------------------|--------------------|----------------------|-------------------|----------------------|-------------|--|--------------------|---------------------------------|---|
|                | SW-1 | Enhanced Organic Waste Diversion    | A Enhance implementation of existing recycling and composting programs through education and outreach, including specific enhanced yard waste and construction and demolition waste diversion programs. | 130                | 5,000             | 0                  | 12,000               | 0%                | 47,000               | 6,700       | Annual Labor: Assumes one staff time at 6.3% FTE per year for overseeing outreach program and C&D site enforcement<br>Annual Direct: NA<br>One-Time Direct: Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)  | 10,900             | 159                             | 68  |
|                |      |                                     | B Incorporate waste reduction measures into future solid waste and recycling franchise agreements.  | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes cost neutral<br>Annual Direct: NA<br>One-Time Direct: NA   |                    |                                 |   |
|                |      |                                     | C Explore implementation of a commercial recycling program to divert commercial solid waste.  | 65                 | 2,500             | 0                  | 12,000               | 0%                | 29,500               | 4,200       | Annual Labor: Assumes one staff time at 3.1% FTE per year for overseeing program<br>Annual Direct: NA<br>One-Time Direct: Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)  |                    |                                 |   |
|                | SW-2 | Methane Recovery                    | A Consult with County staff to verify the installed methane capture system at the West central Landfill achieves the estimated 75% control efficiency.  | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: No future cost estimated as already implemented  | 0                  | 3,319                           | NA  |
| Subtotal       |      |                                     |   | 195                | 7,500             | 0                  | 24,000               | NA                | 76,500               | 10,900      |  |                    |                                 |   |
| Transportation |      |                                     | Actions   | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions  | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness<br>(Annual Cost/<br>Annual MT CO <sub>2</sub> e) |
|                | T-1  | Mixed Use Development               | A Conduct a community visioning process to identify the goals for commercial center retrofits and new mixed-use centers, and recommend sites with the highest potential.                                | 0                  | 0                 | 0                  | 25,000               | 50%               | 12,500               | 1,800       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$25k for visioning process and report (e.g., consulting fees, staff support, Council hearing)   | 7,000              | 821                             | 9   |
|                |      |                                     | B Create streamlined permitting process for higher density and mixed-use developments.  | 0                  | 0                 | 0                  | 18,000               | 50%               | 9,000                | 1,300       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$18k for development of higher density/mixed use streamlining program (e.g., consulting fees, staff support, Council hearing)   |                    |                                 |   |
|                |      |                                     | C Develop commercial center retrofit and mixed-use development design guidelines.   | 0                  | 0                 | 0                  | 55,000               | 50%               | 27,500               | 3,900       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$55k for development of design guidelines (e.g., consulting fees, staff support, Council hearing)   |                    |                                 |   |
|                | T-2  | Bicycle Lane Expansion              | A Continue to pursue grant funding opportunities to implement the Anderson Bicycle Transportation Plan.   | 104                | 4,000             | 0                  | 0                    | 0%                | 28,000               | 4,000       | Annual Labor: Assumes one staff time at 5% FTE per year to pursue grant funding<br>Annual Direct: NA<br>One-Time Direct: NA  | 57,200             | 23                              | 2,534   |
|                |      |                                     | B Establish standards for the ratio of bicycle lanes and paths to mile of road  | 39                 | 1,500             | 0                  | 5,000                | 0%                | 15,500               | 2,200       | Annual Labor: Assumes one staff time at 1.9% FTE per year additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes \$5k developing standards (e.g., consulting fees, Council hearing)  |                    |                                 |   |
|                |      |                                     | C Develop design guidelines and design standards to promote installation of bicycle infrastructure.   |                    | 0                 | 0                  | 25,000               | 0%                | 25,000               | 3,600       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$25k developing guidelines and standards (e.g., consulting fees, Council hearing)   |                    |                                 |   |
|                |      |                                     | D Develop appropriate bicycle infrastructure for high traffic street segments and intersections.  | 156                | 6,000             | 32,000             | 352,800              | 50%               | 309,400              | 44,200      | Annual Labor: Assumes one staff time at 7.5% FTE per year to oversee implementation<br>Annual Direct: Assumes average of \$1600/mile maintenance cost for bike path/lanes and 10 miles of new bike path by 2020.<br>One-Time Direct: Assumes 20 miles of new bike infrastructure by 2020 and 5% of the new infrastructure will be class 1 bike path with a \$214,100/mile construction cost and 95% of the new infrastructure will be class 2 bike lanes (requiring striping and signs) with a \$7,300/mile construction cost. |                    |                                 |   |
|                |      |                                     | E Implement a bicycle way finding / signage program.  | 0                  | 0                 | 0                  | 45,000               | 50%               | 22,500               | 3,200       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$45k developing wayfinding/ signage program (e.g., planning and implementation)   | 46,900             | 781                             | 60  |
|                | T-3  | Pedestrian Environment Enhancements | A Pursue Safe Routes-to-School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements.   | 260                | 10,000            | 25,000             | 300,000              | 50%               | 272,500              | 38,900      | Annual Labor: Assumes one staff time at 12.5% FTE per year to oversee implementation<br>Annual Direct: Assumes \$25K annual maintenance costs<br>One-Time Direct: Assumes \$300k initial cost of improvements  |                    |                                 |   |
|                |      |                                     | B Identify existing gaps in sidewalk infrastructure within the City and develop implementation plan to remove gaps and other barriers to pedestrian connectivity in the community.                      | 0                  | 0                 | 0                  | 25,000               | 75%               | 6,250                | 900         | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes 25k for sidewalk gap analysis (e.g., consulting fees)  |                    |                                 |   |
|                |      |                                     | C Pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network.  | 104                | 4,000             | 0                  | 0                    | 0%                | 28,000               | 4,000       | Annual Labor: Assumes one staff time at 5% FTE per year to pursue grant funding<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
|                |      |                                     | D Develop ordinance that requires new discretionary projects to develop multiuse, when feasible.  | 26                 | 1,000             | 0                  | 15,000               | 0%                | 22,000               | 3,100       | Annual Labor: Assumes one staff time at 1.3% FTE per year additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k developing ordinance (e.g., consulting fees, Council hearing)   |                    |                                 |   |

| Transportation - Continued |      |                        | Actions |  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions   |                    |                                 |   |
|----------------------------|------|------------------------|---------|--|--------------------|-------------------|--------------------|----------------------|-------------------|----------------------|-------------|---|--------------------|---------------------------------|---|
|                            | T-4  | Commute Trip Reduction | A       | Develop a ride-matching website  | 52                 | 2,000             | 4,800              | 20,000               | 25%               | 50,700               | 7,200       | Annual Labor: Assumes one staff time at 2.5% FTE per year to oversee ride match program<br>Annual Direct:Assumes \$400/month management fee for rideshare website and software.<br>One-Time Direct: Assumes \$20k purchase costs for rideshare software | 12,300             | 20                              | 615   |
|                            |      |                        | B       | Identify transit stops in high-activity areas that would benefit from additional enhancements (e.g., shelter, seating, electronic arrival/departure information) | 0                  | 0                 | 0                  | 15,000               | 25%               | 11,250               | 1,600       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes 15k for transit stop study (e.g., consulting fees)  |                    |                                 |   |
|                            |      |                        | C       | Pursue funding for transit stop improvements   | 91                 | 3,500             | 0                  | 0                    | 0%                | 24,500               | 3,500       | Annual Labor: Assumes one staff time at 4.4% FTE per year to pursue grants<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
| Subtotal                   |      |                        |         |  | 832                | 32,000            | 61,800             | 900,800              | NA                | 864,600              | 123,400     |   |                    |                                 |   |
| Green Infrastructure       |      |                        | Actions |  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions   | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
|                            | GI-I | Urban Forest           | A       | Develop outreach program to advertise the benefits of planting shade trees around buildings and parking lots.  | 52                 | 2,000             | 0                  | 10,000               | 25%               | 18,000               | 2,600       | Annual Labor: Assumes one staff time at 2.5% FTE per year to pursue grants<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)   | 24,500             | 50                              | 490   |
|                            |      |                        | B       | Evaluate the carbon sequestration potential of planned urban forestry projects.  | 0                  | 0                 | 0                  | 20,000               | 0%                | 20,000               | 2,900       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$20k for carbon analysis (e.g. consultant fees)  |                    |                                 |   |
|                            |      |                        | C       | Identify potential locations and plant trees within the downtown commercial district.  | 0                  | 0                 | 13,333             | 40,000               | 0%                | 133,333              | 19,000      | Annual Labor: In this action labor is included in Annual Direct Cost<br>Annual Direct: Assume \$100 per tree per year and 200 trees<br>One-Time Direct: Assumes \$200 per tree and 200 new trees planted  |                    |                                 |   |
| Subtotal                   |      |                        |         |  | 52                 | 2,000             | 13,333             | 70,000               | NA                | 171,333              | 24,500      |   |                    |                                 |   |
| TOTAL COSTS 2012 - 2020    |      |                        |         |  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost |   | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| Cost                       |      |                        |         |  | 1,573              | 60,500            | 85,133             | 1,116,800            | NA                | 1,401,058            | 199,800     |   |                    |                                 |   |
| Additional FTE Staff       |      |                        |         |  | 0.76               |                   |                    |                      |                   |                      |             |   |                    |                                 |   |

Other Assumptions

|                                     |           |
|-------------------------------------|-----------|
| Years of Implementation (2020-2013) | 7         |
| City Staff FTE Salary and Benefits  | \$ 80,000 |
| FTE Hours per Year                  | 2,080     |

NOTE: This analysis is only an estimate of measure implementation cost. The County and cities will work to foster partnerships and obtain grants to carry out these measures in a cost-effective manner.

| City of Shasta Lake - Estimated Cost to Jurisdiction of CAP Measure Implementation 2012-2020 |      |                                   |   |                    |                   |                    |                      |                   |                      |             |  |                    |                                 |   |
|--|------|-----------------------------------|---|--------------------|-------------------|--------------------|----------------------|-------------------|----------------------|-------------|--|--------------------|---------------------------------|---|
| Energy   |      |                                   |   |                    |                   |                    |                      |                   |                      |             |  |                    |                                 |   |
| Energy Efficiency  |      |                                   | Actions   | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions  | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
|  | BE-1 | Existing Buildings                | A Continue to promote and improve utility incentives for energy conservation programs for older homes and renovations through One-Stop Permit Center.   | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes continuation of current Shasta Lake Electric initiatives<br>Annual Direct: NA<br>One-Time Direct: NA   | 2,700              | 25                              | 109   |
|  |      |                                   | B Facilitate the use of energy efficient demonstration homes as an education and promotion tool.  | 52                 | 2,000             | 0                  | 5,000                | 0%                | 19,000               | 2,700       | Annual Labor: Assume one staff time at 2.5% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$5k in outreach campaign costs (e.g. website, pamphlets, posters)   |                    |                                 |   |
|  | BE-2 | New Construction                  | A Continue to promote and provide utility incentives for energy efficiency programs in new residential buildings through One-Stop Permit Center.  | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes continuation of current Shasta Lake Electric and City initiatives<br>Annual Direct: NA<br>One-Time Direct: NA  | 3,100              | 0                               | NA  |
|  |      |                                   | B Develop a priority permitting program for new residential projects that demonstrate 15% higher efficiency than Title 24 requirements.   | 26                 | 1,000             | 0                  | 15,000               | 0%                | 22,000               | 3,100       | Annual Labor: Assume one staff time at 1.3% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k developing priority permitting program (e.g., consulting fees, council hearing)  |                    |                                 |   |
|  | BE-3 | Commercial Lighting               | A Continue to promote and provide utility incentives for commercial interior lighting retrofits.  | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes continuation of current Shasta Lake Electric initiatives<br>Annual Direct: NA<br>One-Time Direct: NA   | 2,700              | 137                             | 20  |
|  |      |                                   | B Develop a parking lot and public area lighting-specific outreach program.   | 26                 | 1,000             | 0                  | 12,000               | 0%                | 19,000               | 2,700       | Annual Labor: Assume one staff time at 1.3% FTE per year<br>Annual Direct: NA<br>One-Time Direct: Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)  |                    |                                 |   |
|  | BE-4 | Efficient Appliances              | A Continue community educational outreach and distribution of information regarding efficient appliances and utility rebate programs through the One Stop Permit Center.  | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes continuation of current Shasta Lake Electric and City initiatives<br>Annual Direct: NA<br>One-Time Direct: NA  | 0                  | 173                             | 0   |
|  |      |                                   | B Continue the Kill-a-Watt program.   | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes continuation of current Shasta Lake Electric and City initiatives<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
| Renewable Energy   |      |                                   | Actions   | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions  | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
|  | BE-5 | Solar Water Heaters               | A Work with California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential buildings.  | 52                 | 2,000             | 0                  | 8,000                | 0%                | 22,000               | 3,100       | Annual Labor: Assumes one staff time at 2.5% FTE per year for overseeing outreach program<br>Annual Direct: NA<br>One-Time Direct: Assumes \$8k in outreach campaign costs (e.g. website, pamphlets, posters)<br>Assumes cost sharing with BE- 6 Action A. | 5,200              | 254                             | 20  |
|  |      |                                   | B Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation.   | 0                  | 0                 | 0                  | 15,000               | 0%                | 15,000               | 2,100       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k developing streamlined permitting program (e.g., consulting fees, Council hearing)   |                    |                                 |   |
|  | BE-6 | Solar PV Systems                  | A Review City regulations, ordinances, and codes to identify and remove, when appropriate, any barriers to solar system installation.   | 0                  | 0                 | 0                  | 20,000               | 0%                | 20,000               | 2,900       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$20k developing priority permitting program (e.g., consulting fees, Council hearing)  | 6,000              | 867                             | 7   |
|  |      |                                   | B Develop a solar outreach campaign that encourages property owners to install PV systems and participate in PPA agreements with solar service providers.   | 52                 | 2,000             | 0                  | 8,000                | 0%                | 22,000               | 3,100       | Annual Labor: Assumes one staff time at 2.5% FTE per year for overseeing outreach program<br>Annual Direct: NA<br>One-Time Direct: Assumes \$8k in outreach campaign costs (e.g. website, pamphlets, posters)<br>Assumes cost sharing with BE- 7 Action B  |                    |                                 |   |
| Subtotal   |      |                                   |   | 208                | 8,000             | 0                  | 83,000               | NA                | 139,000              | 19,700      |  |                    |                                 |   |
| Water  |      |                                   | Actions   | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions  |                    |                                 |   |
|  | W-1  | Water Efficiency and Conservation | A Continue to provide information to the public on water conservation measures through the City's One-Stop Permit Center.   | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes continuation of current City initiatives<br>Annual Direct: NA<br>One-Time Direct: NA   |                    |                                 |   |
|  |      |                                   | B Continue to use automated water meter system to gather hourly data and review usage patterns and notify customers abnormal water usage.   | 0                  | 0                 | 0                  | 0                    | 0%                | 0                    | 0           | Annual Labor: Assumes continuation of current City initiatives<br>Annual Direct: NA<br>One-Time Direct: NA   |                    |                                 |   |
|  |      |                                   | C Ensure compliance with the Water Efficient Landscape Ordinance (Shasta Lake Municipal Code Chapter 15.10) by providing Application Checklists to developers and assisting with explaining requirements of the Code. | 26                 | 1,000             | 0                  | 0                    | 0%                | 7,000                | 1,000       | Annual Labor: Assumes one staff time at 2.5% FTE per year additional counter time<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |

| Water - Continued |   |  | Actions | Annual Labor Hours   | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions |  |                                 |   |       |
|-------------------|---|--|---------|--|-------------------|--------------------|----------------------|-------------------|----------------------|-------------|-------------|--|---------------------------------|---|-------|
| W-1               | Water Efficiency and Conservation Continued |  | D       | Provide information to property owners and developers at the One-Stop Permit Center regarding the design, installation, management and maintenance of water efficient landscapes.  | 26                | 1,000              | 0                    | 5,000             | 0%                   | 12,000      | 1,700       | Annual Labor: Assumes one staff time at 1.3% FTE per year additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes \$5k in outreach campaign costs (e.g. website, pamphlets, posters)  | 4,400                           | 0   | NA    |
|                   |   |  | E       | Provide information regarding installation of graywater and rainwater systems for landscape irrigation and appropriate indoor applications through the One-Stop Permit Center.   | 26                | 1,000              | 0                    | 5,000             | 0%                   | 12,000      | 1,700       | Annual Labor: Assumes one staff time at 1.3% FTE per year additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes \$5k in outreach campaign costs (e.g. website, pamphlets, posters)  |                                 |   |       |
| Subtotal          |   |  |         |  | 78                | 3,000              | 0                    | 10,000            | NA                   | 31,000      | 4,400       |  |                                 |   |       |
| Solid Waste       |   |  | Actions | Annual Labor Hours   | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions | Total Measure Cost   | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |       |
| SW-1              | Enhanced Organic Waste Diversion            |  | A       | Enhance implementation of existing recycling and composting programs through education and outreach, including specific enhanced yard waste and construction and demolition waste diversion programs.  | 130               | 5,000              | 0                    | 12,000            | 0%                   | 47,000      | 6,700       | Annual Labor: Assumes one staff time at 6.3% FTE per year for overseeing outreach program and C&D site enforcement<br>Annual Direct: NA<br>One-Time Direct: Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)  | 10,900                          | 118   | 93    |
|                   |   |  | B       | Incorporate waste reduction measures into future solid waste and recycling franchise agreements.   | 0                 | 0                  | 0                    | 0                 | 0%                   | 0           | 0           | Annual Labor: Assumes cost neutral<br>Annual Direct: NA<br>One-Time Direct: NA   |                                 |   |       |
|                   |   |  | C       | Implement a commercial recycling program to divert commercial solid waste.   | 65                | 2,500              | 0                    | 12,000            | 0%                   | 29,500      | 4,200       | Annual Labor: Assumes one staff time at 3.1% FTE per year for overseeing program<br>Annual Direct: NA<br>One-Time Direct: Assumes \$12k in outreach campaign costs (e.g. website, pamphlets, posters)  |                                 |   |       |
| SW-2              | Methane Recovery                            |  | A       | Consult with County staff to verify the installed methane capture system at the West central Landfill achieves the estimated 75% control efficiency.   | 0                 | 0                  | 0                    | 0                 | 0%                   | 0           | 0           | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: No future cost estimated as already implemented  | 0                               | 2,551   | NA    |
| Subtotal          |   |  |         |  | 195               | 7,500              | 0                    | 24,000            | NA                   | 76,500      | 10,900      |  |                                 |   |       |
| Transportation    |   |  | Actions | Annual Labor Hours   | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions | Total Measure Cost   | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |       |
| T-1               | Mixed Use Development                       |  | A       | Update General Plan to incorporate healthy community goals and policies.   | 0                 | 0                  | 0                    | 75,000            | 50%                  | 37,500      | 5,400       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$75k for GP update (e.g., consulting fees, staff support, Council hearing)  | 12,400                          | 290   | 43    |
|                   |   |  | B       | Conduct a community visioning process to identify the goals for commercial center retrofits and new mixed-use centers, and recommend sites with the highest potential.   | 0                 | 0                  | 0                    | 25,000            | 50%                  | 12,500      | 1,800       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$25k for visioning process and report (e.g., consulting fees, staff support, Council hearing)   |                                 |   |       |
|                   |   |  | C       | Create streamlined permitting process for higher density and mixed-use developments.   | 0                 | 0                  | 0                    | 18,000            | 50%                  | 9,000       | 1,300       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$18k for development of higher density/mixed use streamlining program (e.g., consulting fees, staff support, Council hearing)   |                                 |   |       |
|                   |   |  | D       | Develop commercial center retrofit and mixed-use development design guidelines.  | 0                 | 0                  | 0                    | 55,000            | 50%                  | 27,500      | 3,900       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$55k for development of design guidelines (e.g., consulting fees, staff support, Council hearing)   |                                 |   |       |
| T-2               | Bicycle Lane Expansion                      |  | A       | Continue to pursue grant funding opportunities to implement the Shasta Lake Bike Plan. For example, continue to pursue grant funding through Healthy Shasta to identify appropriate public locations for the installation of Healthy Shasta bicycle racks. | 104               | 4,000              | 0                    | 0                 | 0%                   | 28,000      | 4,000       | Annual Labor: Assumes one staff time at 5% FTE per year to pursue grant funding<br>Annual Direct: NA<br>One-Time Direct: NA  | 57,200                          | 14  | 4,192 |
|                   |   |  | B       | Establish standards for the ratio of bicycle lanes and paths to mile of road.  | 39                | 1,500              | 0                    | 5,000             | 0%                   | 15,500      | 2,200       | Annual Labor: Assumes one staff time at 1.9% FTE per year additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes \$5k developing standards (e.g., consulting fees, Council hearing)  |                                 |   |       |
|                   |   |  | C       | Complete design guidelines and design standards to promote installation of bicycle infrastructure.   |                   | 0                  | 0                    | 25,000            | 0%                   | 25,000      | 3,600       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$25k developing guidelines and standards (e.g., consulting fees, Council hearing)   |                                 |   |       |
|                   |   |  | D       | Develop appropriate bicycle infrastructure for high traffic street segments and intersections.   | 156               | 6,000              | 32,000               | 352,800           | 50%                  | 309,400     | 44,200      | Annual Labor: Assumes one staff time at 7.5% FTE per year to oversee implementation<br>Annual Direct: Assumes average of \$1600/mile maintenance cost for bike path/lanes and 10 miles of new bike path by 2020.<br>One-Time Direct: Assumes 20 miles of new bike infrastructure by 2020 and 5% of the new infrastructure will be class 1 bike path with a \$214,100/mile construction cost and 95% of the new infrastructure will be class 2 bike lanes (requiring striping and signs) with a \$7,300/mile construction cost. |                                 |   |       |

| Transportation - Continued |                                     |   | Actions  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions  |                    |                                 |   |
|----------------------------|-------------------------------------|---|--|--------------------|-------------------|--------------------|----------------------|-------------------|----------------------|-------------|--|--------------------|---------------------------------|---|
| T-2                        | Bicycle Lane Expansion Continued    | E | Implement a bicycle way finding / signage program.   | 0                  | 0                 | 0                  | 45,000               | 50%               | 22,500               | 3,200       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$45k developing wayfinding/ signage program (e.g., planning and implementation)   |                    |                                 |   |
| T-3                        | Pedestrian Environment Enhancements | A | Pursue Safe Routes-to-School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements.                    | 260                | 10,000            | 25,000             | 300,000              | 50%               | 272,500              | 38,900      | Annual Labor: Assumes one staff time at 12.5% FTE per year to oversee implementation<br>Annual Direct:Assumes \$25K annual maintenance costs<br>One-Time Direct: Assumes \$300k initial cost of improvements | 46,900             | 31                              | 1,522   |
|                            |                                     | B | Identify existing gaps in sidewalk infrastructure within the City and develop implementation plan to remove gaps and other barriers to pedestrian connectivity in the community. | 0                  | 0                 | 0                  | 25,000               | 75%               | 6,250                | 900         | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes 25k for sidewalk gap analysis (e.g., consulting fees)  |                    |                                 |   |
|                            |                                     | C | Pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network.   | 104                | 4,000             | 0                  | 0                    | 0%                | 28,000               | 4,000       | Annual Labor: Assumes one staff time at 5% FTE per year to pursue grant funding<br>Annual Direct: NA<br>One-Time Direct: NA  |                    |                                 |   |
|                            |                                     | D | Develop ordinance that requires new discretionary projects to develop multiuse, when feasible.   | 26                 | 1,000             | 0                  | 15,000               | 0%                | 22,000               | 3,100       | Annual Labor: Assumes one staff time at 1.3% FTE per year additional counter time<br>Annual Direct: NA<br>One-Time Direct: Assumes \$15k developing ordinance (e.g., consulting fees, Council hearing)       |                    |                                 |   |
| Subtotal                   |                                     |   |  | 689                | 26,500            | 57,000             | 940,800              | NA                | 815,650              | 116,500     |  |                    |                                 |   |
| Green Infrastructure       |                                     |   | Actions  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost | Assumptions  | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| GI-1                       | Enhance Urban Forest                | A | Develop outreach program to advertise the benefits of planting shade trees around buildings and parking lots.  | 52                 | 2,000             | 0                  | 10,000               | 25%               | 18,000               | 2,600       | Annual Labor: Assumes one staff time at 2.5% FTE per year to pursue grants<br>Annual Direct: NA<br>One-Time Direct: Assumes \$10k in outreach campaign costs (e.g. website, pamphlets, posters)              | 24,500             | 190                             | 129   |
|                            |                                     | B | Evaluate the carbon sequestration potential of planned urban forestry projects.  | 0                  | 0                 | 0                  | 20,000               | 0%                | 20,000               | 2,900       | Annual Labor: NA<br>Annual Direct: NA<br>One-Time Direct: Assumes \$20k for carbon analysis (e.g. consultant fees)   |                    |                                 |   |
|                            |                                     | C | Identify potential locations and plant trees within the downtown commercial district.  | 0                  | 0                 | 13,333             | 40,000               | 0%                | 133,333              | 19,000      | Annual Labor: In this action labor is included in Annual Direct Cost<br>Annual Direct: Assume \$100 per tree per year and 200 trees<br>One-Time Direct: Assumes \$200 per tree and 200 new trees planted     |                    |                                 |   |
| Subtotal                   |                                     |   |  | 52                 | 2,000             | 13,333             | 70,000               | NA                | 171,333              | 24,500      |  |                    |                                 |   |
| TOTAL COSTS 2012 - 2020    |                                     |   |  | Annual Labor Hours | Annual Labor Cost | Annual Direct Cost | One Time Direct Cost | % External Funded | Total 2012-2020 Cost | Annual Cost |  | Total Measure Cost | Measure GHG Reduction Potential | Cost Effectiveness (Annual Cost/ Annual MT CO <sub>2</sub> e) |
| Cost                       |                                     |   |  | 1,144              | 44,000            | 70,333             | 1,117,800            | NA                | 1,202,483            | 171,600     |  |                    |                                 |   |
| Additional FTE Staff       |                                     |   |  | 0.55               |                   |                    |                      |                   |                      |             |  |                    |                                 |   |

Other Assumptions

|                                     |           |
|-------------------------------------|-----------|
| Years of Implementation (2020-2013) | 7         |
| City Staff FTE Salary and Benefits  | \$ 80,000 |
| FTE Hours per Year                  | 2,080     |

NOTE: This analysis is only an estimate of measure implementation cost. The County and cities will work to foster partnerships and obtain grants to carry out these measures in a cost-effective manner.